Tanganyika Territory.

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ANNUAL MEDICAL REPORT.

ANNUAL REPORT OF THE SANITATION BRANCH OF THE MEDICAL DEPARTMENT.

REPORT OF THE DAR-ES-SALAAM LABORATORY.

For the Year 1922.

Tanganyika Territory.

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TANGANYIKA TERRITORY.

Annual Medical Report, 1922.

INTRODUCTORY.

General.

This is the third Report of the Medical and Sanitation Department of the Tanganyika Territory. The first Report covered the period November, 1918, to November, 1920, and was necessarily deficient in many details. Standardised reports and returns were brought into general use during 1920, and new appointments to the staff during that year enabled the organisation of the Department to become more settled: the general administrative arrangements of the Territory had now been decided upon and the disposition of the Medical Staff was made to conform. The present Report follows closely the lines of the Report for 1921. Some of its sections, especially that of the Senior Sanitation Officer, have been compiled under unavoidable disadvantages. The new Senior Sanitation Officer arrived at headquarters on first appointment on December 26th, 1922, and, although he had some previous experience of the country, gained during the war, the events of sanitary importance during 1922 were new to him. Moreover, Dr. R. R. Scott, M.C., who has been responsible for the sanitary organisation of Dar-es-Salaam almost continuously since the establishment of British administration, was on leave from the middle of May until the end of the year. The Director of the Laboratory, also, was on leave for some months during the year, and the Principal Medical Officer did not return until August; shortly afterwards Dr. Shircore, who had acted as Principal Medical Officer and was responsible for the 1921 report, proceeded on leave. None of the authors of the present report was, therefore, in the Territory throughout the year.

Climatic Conditions and the Public Health, 1922.

The health of the population of the Territory in the year 1922 was less satisfactory than in the preceding year; more deaths of both official and non-official Europeans were reported, and more European and Asiatic officials were invalided than in 1921 (see Tables A and B, pp. 39 and

42.) On the coast, where a large proportion of the European and Asiatic population resides,* rain fell on several days during what are normally the dry months, and the atmospheric humidity was maintained at a high level throughout the year (see report of Medical Officer of Health, Dar-es-Salaam, p. 137). It is reported that 1922 was a trying and unhealthy year on the coast in the adjoining territories as well as in Tanganyika.

The researches of Gill in India have demonstrated the important rôle played by atmospheric humidity in malarial infection in the tropics. He concludes that a monthly mean temperature of 61° F., in association with a monthly mean (8.0 a.m.) humidity of 63 per cent., comprise, approximately, the lower limits necessary for the transmission of malaria. Reference to the Director of the Laboratory's Report, p. 190, Section G, shows that the records made at Dar-es-Salaam were well above these limits throughout the year; this was the case also in 1921 (Annual Medical Report, 1921, pp. 204-205). That 1922 was a more trying and unhealthy year than 1921 may be explained by the distinctly higher mean humidity during the cooler months (June-September); there was but little difference in the mean temperature during this period in the two years.

From stations other than Dar-es-Salaam, humidity returns are not available. There is no reason to suppose that those relating to towns on the coast would materially differ from the records kept at Dar-es-Salaam, and one must assume that, on the coast, malarial infection is possible throughout the year. In many inland towns, also, it is probable that the potential period of infection normally extends over many months of the year. In a few localities, *e.g.*, Arusha town, infection is possible only for brief periods of the year, if at all. On the results of a spleen census and general observations the Medical Officer, Arusha, believes that there is no endemic malaria in Arusha town, but further observations are necessary. In Dar-es-Salaam the rise of humidity in May consequent upon the heavy rainfall that month and the declining mean temperature (see pp. 190-191, Director of Laboratory's Report) was followed by a distinct rise in the malaria morbidity which continued during June and July (see Table C, p. 43, and graph, p. 184, Director of Laboratory's Report). The graph (p. 191) shows, also, an even higher rise in malaria morbidity in November and December; this was largely due to an influx of susceptibles (recruits for the K.A.R.) from high level country in the interior; the Table C, p. 43, shows only a moderate increase of malaria amongst European and Asiatic officials during November and December, following upon the slightly increased humidity in November.

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* Census 1921 : 912 out of 2,447 European Population, and 350 out of 621 officials live in coast districts.

Tables C, D, and E, p. 43, show the large part which malaria and blackwater fever play in the general morbidity amongst European and Asiatic officials in the three principal towns. The proportion which these two diseases contribute to the death and invaliding rates in both classes of officials is shown in the statements on pp. 38 and 40-41.

Malaria, then, is clearly the most important factor influencing the health of Europeans and Asiatics in the Territory. Enteric fever, dysentery and other infective diseases play a very minor rôle. The main obstacle to reduction of the malaria rate amongst European and Asiatics in the coast towns is, in the writer's opinion, the excessive amount of vegetation—principally cocoanut palms and mango trees. Great improvements have been effected, at considerable cost, in Dar-es-Salaam by draining creeks, filling up low-lying areas, sealing wells and soakage pits and improvements to drainage generally; constant watchfulness is exercised by the Medical Officer of Health and his staff. There is reason to suspect that Asiatics display great laxity in personal prophylaxis and that Europeans do not always exercise sufficient care. Every encouragement is given to the observance of personal anti-malarial measures: information has been disseminated by circular, and mosquito nets are supplied by the Government to all European and Asiatic officials who require them. During 1922, 138,480 tablets, 279 lbs. 15 ozs., and 1,350 ampoules of quinine salts and 1 lb. 15 ozs. of euquinine were issued from the Medical Stores for prophylactic and curative purposes. Nevertheless the morbidity due to malaria remains excessive. The inhabited portion of the town of Lindi is described by the Medical Officer as "a forest of cocoanut palms"; there are estimated to be 10,000 of them, of which 3,000 belong to the Government. The native part of Tanga town, which is continuous with the residential and business part, is practically a cocoanut plantation; the palms actually obstruct the traffic in the street. Dar-es-Salaam has been described as presenting "the appearance of having been built within the confines of a large and formless cocoanut plantation." In addition to the palms there are large numbers of mango and other heavy foliaged trees. From Observation Hill, some 4 or 5 miles inland, Dar-es-Salaam is located by a dense mass of foliage through which only the spires of the two churches are visible.

The effect of this vegetation is: (1) to provide breeding places for mosquitoes; (2) to cut off the sea breezes from the greater number of residences; in Dar-es-Salaam this effect is enhanced by the Botanic Gardens which extend between the first row of houses on the sea front and the town; (3) to increase the atmospheric humidity; (4) to provide convenient refuges for adult mosquitoes.

Some aspects of the question were touched upon in the Annual Report of the Senior Sanitation Officer for 1921 (pp. 106-108 and 114 and 115). Dr. Haworth's investigations (Annual Medical Report, 1921, p. 107) leave little room for doubt as to one important cause of the somewhat disappointing results of our anti-mosquito measures; during 16 consecutive days in May, 1921, he captured 1,565 mosquitoes in his quarters at Tanga.

HEALTH OF EUROPEAN WOMEN AND CHILDREN.

The changed conditions in England, resulting from the war, have accelerated a gradually progressing increase in the responsibilities of the Medical Departments of the East African Services with regard to the treatment of European women and children. Twenty years ago few officials were married and even fewer ventured to bring their wives to East Africa; the birth of a European child in East Africa was an infrequent event. Before the war, the advances in knowledge of tropical diseases had robbed the climate of many of its terrors, and senior officials now began to bring their wives out with them. One result of the war was earlier marriages.

At the present time, a large proportion of officials, even the most junior, are married, their wives and children accompany them to the most remote out-stations. The census of 1921 shows that of 2,447 Europeans resident in the Territory 521 were women and 443 children under 16; women and children formed 39·23 per cent. of the total European population. Of the Asiatic population women and children out-number adult males. On the whole this change is for good from a medical view point; the married official enjoys a more comfortable home and better health. The hot moist climate of the coast stations no doubt tries women severely, and some suffer penalties for a failure to appreciate that what can be done with impunity in a European climate cannot for long be done in a highly malarious country within 10 degrees of the Equator. On children the climate tells hardly, and from every point of view it can seldom be wise to keep them in the Territory after reaching five years of age; financial and other private reasons almost necessarily override these considerations in not a few instances.

HEALTH RESORTS.

Compared with Kenya and Nyasaland, Tanganyika Territory is at a disadvantage in regard to accessibility of healthy localities to which convalescents from serious illness and women and children during the hot months can be sent from the coast and other unhealthy parts of the country. The question concerns more particularly the coast stations where, as already shown, most of the European officials reside. From an early period of residence in Dar-es-Salaam the writer was impressed with the benefit to health and working capacity which would result from the removal of the capital to an elevated and malaria free site. For such a scheme to have any prospect of being realised, it was essential that it should be defined before any extensive building programme in Dar-es-Salaam was embarked upon. Some of the preparatory investigations are recorded by the Senior Sanitation Officer at pp. 111-113 of the Annual Medical Report for 1921. They and financial considerations soon dissipated all hope of success. It must be many years before the example of Kenya, in removing the capital from Mombasa to Nairobi, can be followed. Meanwhile the problem of a health resort for officials and their families who reside at headquarters presses for solution. Tanga is more favourably situated, for it is within a few hours of several hill stations, including Vugiri, where the climate is healthy and pleasant.

Vugiri Sanatorium.

Financial considerations have prevented the re-opening of this well-designed establishment. It consists of a large central building comprising two dining halls, lounge, two billiard rooms, two large verandahs, the front ends of which are glazed, a block of eight bedrooms, each having a separate portion of verandah in front and opening on to a common verandah behind and several well-constructed bungalows. There is a quantity of excellent furniture and equipment in the buildings which are in good repair. It occupies a beautiful position on a spur of the Usambara mountains and lies at an altitude of about 3,400 feet above sea level. Its chief drawback is inaccessibility from the greater part of the Territory.

From Tanga about a four-and-a-half hours' journey by train takes one to Korogwe station, whence Vugiri is reached by a winding ascent of 12 miles by road. A train runs to Korogwe from Tanga daily. The uncertainty of steamer sailings between Dar-es-Salaam and Tanga is the chief difficulty.

The need of a sanatorium in the Territory is great; there are few places on the Central line presenting special attractions in climate or otherwise, and the problem of advising where sick leave should be spent is a difficult one. Some convalescents, who are now invalided home, might well return to duty after sick leave spent in a suitable locality such as Vugiri.

HEALTH OF NATIVE POPULATION, 1922.

According to the German census of 1913, the native population of that part of German East Africa, which is now under British control, was 4,145,000. Eight years later, after four years of war, it was 4,107,000. The most densely populated districts of German East Africa, viz., Ruanda and Urundi, are now under Belgian rule; their population was about 3,500,000 in 1913.

There are, therefore, about 11·01 natives to the square mile in Tanganyika Territory. The future of the country is believed to lie in agricultural development and the prevention of avoidable loss of native life becomes, therefore, of prime importance.

The most notable event as regards the health of the native population was the discovery, in March, 1922, of a focus of human trypanosomiasis in the Mwanza District. This is reported upon in full in the Senior Sanitation Officer's Report, pp. 117-123. Particular interest, both with regard to origin and spread, attaches to this outbreak. The former must probably remain a matter for speculation; its occurrence in close proximity to an area previously infected with the Congo form of the disease and remote from any focus of Rhodesian sleeping sickness will be noted in connection with Dr. Duke's opinion that *T. rhodesiense* is the organism responsible. Clinical records strongly support his opinion. Dr. Duke's view that direct mechanical transmission by the tsetse fly is the method of spread from sick to healthy revives a controversy thought to have been finally settled by German experimental work, confirmed by British investigators, years ago. Recent reports on the effects of evacuation of the population from the fly infested area do not seem to support Dr. Duke's opinion, but further enquiries are needed. So far as information goes the outbreak is limited and, though continued watchfulness is essential, no serious developments are anticipated.

The infective diseases are dealt with in full in the report of the Senior Sanitation Officer, pp. 102-123; the gratifying reduction of the number of cases of small-pox must be largely attributed to the excellent lymph produced in the Laboratory. The training of native vaccinators at the Health Offices, Dar-es-Salaam, has been continued, and by their agency it is hoped to protect a large proportion of the native population.

WORK OF THE GOVERNMENT HOSPITALS AND DISPENSARIES, 1922.

Table G, p. 63, shows the number of cases treated by the medical staff during 1922, and is compiled from the returns of 27 stations. It supplies the information contained in Tables A and G of the Report for

1921. It is thought that nothing is gained by setting out at length the figures for each station and they are now combined in one return. In addition there are 28 posts at which a dispensary and, in some instances, a small hospital for emergency native cases, is in charge of an Asiatic compounder or native hospital attendant. Table E of last year's Report does not appear in the present Report; the number of in- and out-patients respectively is shown in Table G.

It will be seen that in 1922 there was a decrease of some 9,000 cases treated compared with 1921. This is accounted for by the fact that returns from Songea were not received in time for inclusion this year and the returns from five other small stations (Mafia, Mbulu, Mohoro, Musoma and Shinyanga), which appeared in last year's Report, are not included. As the Department was represented at these stations only by a compounder or native dispenser the returns are not sufficiently accurate to be of value. On the other hand, returns from two new stations, Mikindani and Kahama, are included.

The number of in-patients treated during 1922 shows an increase of 1,587 over last year's figures, the percentage mortality amongst them being 3·43 per cent., as against 3·71 per cent in 1921. The increase in in-patient work is reflected also in Table F, pp. 60-62, which shows 956 surgical operations performed, an increase of 113 over 1921.

The apparent decrease in the total cases treated during the year under review is therefore due to the non-inclusion of out-patient returns from several small stations and from Songea; at the principal stations the work is growing rapidly, as the figures below show :—

	In-Patients		Out-Patients		Total	
	1921	1922	1921	1922	1921	1922
Sewa Hadji Hospital Dar-es-Salaam	1,186	1,870	7,076	12,081	8,262	13,951
Tanga Hospital	816	1,210	5,966	7,577	6,782	8,787

MATERNITY WORK AT THE SEWA HADJI HOSPITAL, DAR-ES-SALAAM.

At the end of August, 1922, a nursing sister was posted to the Sewa Hadji Hospital. She has been able to do much good work in improving the arrangements for the care of the ordinary inmates of the hospital and in other ways, but reports that natives seldom desire European assistance in confinements. Indian women, though ready enough to receive assistance in their homes, will only come into hospital as a last resource. Progress is, therefore, slow, and to the end of the year only one confinement and three cases of puerperal septicæmia were admitted to the words. With the exception of one case of puerperal septicæmia, which died, they did well.

PREVAILING DISEASES OF THE NATIVE POPULATION OF THE TERRITORY.

Reference to the tables and the report of the Senior Sanitation Officer shows that the principal disabling and life-destroying diseases affecting natives, in addition to small-pox and leprosy (which is referred to below, p. 19, are yaws, ankylostomiasis, plague, sleeping sickness, venereal diseases, malaria, filariasis, pneumonia and the ordinary affections of the gastro-intestinal and respiratory systems.

Tuberculosis has definitely established itself and the conditions in many of the larger towns offer every facility for its spread; the Return of Diseases G (pp. 63-68) probably gives but very inadequate prominence to it.

Venereal Diseases.

The Senior Sanitation Officer has commented upon the incidence of these diseases amongst the native population at p. 111 of his report. No legislation dealing specially with the subject has been enacted in the Territory. As in civilised countries, difficulty is experienced in persuading patients to continue attendance after the relief of the more urgent symptoms.

Information is accumulating to show that the important centres of the disease are (*a*) certain of the larger towns; (*b*) two or three districts in which the habits of the people conduce to widespread infection. It does not appear that, with these exceptions, the disease is prevalent amongst the native population.

In the towns there is a large mixed Swahili and Arab Mahomedan population by which any compulsory measures of examination or segregation would probably be strongly resented. In the heavily infected districts, especially Bukoba, there is little doubt but that the active co-operation of the Sultans, who have great authority over their people, could be enlisted without difficulty in combating these diseases. Some have, indeed, urged that active measures should be instigated. Bukoba District, according to the 1921 census, had a native population of 320,100; the people are intelligent, and, I understand, have much in common with the Baganda; their country is rich. The incidence of venereal diseases in Bukoda is undoubtedly very high and this district offers the most suitable field for an active campaign. If the estimates of the prevalence of these diseases in Bukoba are even approximately correct, it is high time that steps were taken. The position in Uganda, where a special anti-venereal organisation exists, appears to be no more serious. In the towns much good has no doubt already been accomplished, thanks to a generous gift of £2,400 for anti-venereal work by the British Red Cross Society, supplies of the necessary apparatus and remedies have been available for the past three years. This fund is now practically exhausted.

Leprosy.

The Senior Sanitation Officer has discussed this question on p. 110 of his report. The distinction of the disease and the segregation camps were described in the reports for 1920 and 1921.

The possibility of improvement of the arrangements for these unfortunate people has been constantly in mind; it resolves itself into a question of finance and staff.

At the present time the average cost of maintaining each leper is about £1 per annum; the actual cost varies greatly in different districts; in Rungwe District some 800 lepers are maintained at a cost of about £100 per annum; at Bagamoyo and Lushoto each leper costs nearly £5 per annum. The cost bears a close relationship to the efficiency of segregation.

A careful estimate of the probable cost of establishing a colony of 200 lepers on an island in the Victoria Nyanza has been made by the Senior Sanitation Officer. He found that an initial expenditure of £1,200 and an annual expenditure of £1,112 per annum for the first two and £750 per annum for subsequent years would be necessary. Items, such as the cost and up-keep of a boat for the visiting Medical Officer, are not included. This estimate, for a people whose staple diet is bananas, falls far short of that for a grain-eating people. For the present, any radical change in the existing system, unsatisfactory as in many respects it is, appears to be out of the question.

Tetanus.

Nine cases were reported with four deaths. Excepting one Goanese child, aged 12, who recovered, they were all natives. One fatal case at Tanga followed an operation for hæmatocele, but whether infection occurred during operation or previously is uncertain; the ward was evacuated and thoroughly cleansed and no more cases occurred.

Malignant Disease.

Nine cases of sarcoma were recorded, the sites being jaw (2), parotid gland, omentum (2), thumb, eyeball; in two cases the site is not mentioned.

In addition, two cases of epulis were reported. Of carcinoma, six cases were reported, the regions affected being stomach, tongue, "leg" (2), and cervix uteri; in one case the site is not mentioned. Rodent ulcer was not met with. In no case was the diagnosis confirmed by microscopical examination. In every case the patient belonged to the native general population class, in which Asiatics, not in Government employ, are included.

Deficiency Diseases.

It is probable that the Return of Diseases gives but a very inadequate picture of the prevalence of this class of disease. The cases of beri beri and scurvy are referred to in the sections on the health of the 6th King's African Rifles and the prisoners respectively. Local shortage of food, due to adverse seasons, destruction of crops by elephants and other wild animals, plagues of rodents and other causes is not infrequent, and probably many cases, returned as anæmia, stomatitis, arthritis, etc., are examples of mild degrees of diet deficiency. One case of pellagra was reported from Mwanza Gaol; it terminated fatally.

MEDICAL HISTORY SHEETS.

During the latter part of the year medical history sheets have been made out for and supplied to every European official. This has involved a scrutiny of all the monthly returns received since the establishment of the civil administration—a task of some magnitude. Duplicates of the medical history sheets have been prepared and are filed in the Principal Medical Officer's office; they are kept up to date from the information contained in the monthly medical reports.

I consider that there should be, in the Principal Medical Officer's office, a medical personal file for each European official; it should contain, in addition to the Medical History Sheet, reports by Medical Officers on serious illnesses, of Medical Boards and extracts of the reports of the Medical Advisers to the Colonial Office on the official when first appointed and when on leave. The existing clerical staff is, however, already fully occupied, and these records are filed together on two files.

THE FINANCIAL RETURN.

Page 36 does not give quite an accurate presentment of the finances of the department, for the financial year commences on April 1st. It has been thought best, for the present year, to give the return in the form in which it appeared in the report for 1921.

Of the total ordinary expenditure of the Territory authorised for 1922/23, that for the Medical and Sanitation Departments formed 6·54 per cent.; of the actual ordinary expenditure, 1920/1921, Medical and Sanitary expenditure formed 7·21 per cent. In England, 21·9 per cent. of the rates are devoted to health services (*Lancet*, 19.8.22), and, excluding the expenditure of the Ministry of Pensions (but not that on Old Age Pensions), 8·66 per cent. of the Civil Services Estimates 1922/23 are for health purposes, including Grants to Hospitals.

INSPECTIONS.

During 1922 the following Hospitals and Dispensaries have been inspected and reported upon by the officers of the Administrative section of the Department

Dar-es-Salaam.—European and Sewa Hadji Hospitals, by the Principal Medical Officer.

Tanga.—European and Native Hospitals, by the Principal Medical Officer.

Dodoma.—Native Hospital (twice), by the Acting Principal Medical Officer.

Tabora.—European and Native Hospitals, by the Acting Principal Medical Officer.

Kigoma and Ujiji Native Hospitals, by the Acting Principal Medical Officer.

Singida and Kondoa-Irangi Hospitals, by Acting Principal Medical Officer.

Mkalama Dispensary, by Acting Principal Medical Officer.

Moshi and Arusha.—The European and Native Hospitals, by the Principal Medical Officer.

Bagamoyo.—Native Hospital, by the Principal Medical Officer.

Lutindi Lunatic Asylum, by the Principal Medical Officer.

Lindi, Kilwa, Kilossa, Morogoro Native Hospitals, by the Acting Senior Sanitation Officer.

Mikindani, Mafia Island, Rufiji Dispensaries, by the Acting Senior Sanitation Officer.

In most cases a general sanitary inspection of the township was made at the time of inspection of these institutions.

The Senior Sanitation Officer has visited and reported upon the sanitary condition of Bukoba, Mwanza and Musoma.

The immense distances and poverty of good communications render it impossible to visit every station annually. There has, moreover, been a large amount of organisation work to accomplish which has prevented prolonged absence from headquarters.

PROFICIENCY IN SWAHILI.

During the year one Nursing Sister passed the Higher Standard examination in Swahili and six Medical Officers, one Nursing Sister and the Principal Medical Officer's European clerk passed the Lower Standard.

LIBRARY.

A reference library, which contained 113 medical books at the end of 1922, is housed in the Principal Medical Officer's office, Dar-es-Salaam. A library of works on bacteriology and pathology is maintained at the Bacteriological Laboratory, Dar-es-Salaam; in addition to a number of German volumes, it contained, on 31st December, 1922, 27 books, added since the British occupation.

117 medical books have also been purchased and issued permanently to out-stations.

A number of scientific periodicals are taken in by the department; some of these are kept in the library at the Principal Medical Officer's office, and others, chiefly on bacteriology and pathology, at the Laboratory.

The volumes and periodicals in the two libraries are issued on loan to out-stations on demand; 17 copies of the Tropical Diseases Bulletin and 11 of the Annals of Tropical Medicine and Parasitology are regularly issued to out-stations. Annual additions are made to the Libraries under votes which for 1922/23 were £74 for "Medical Register and Books," £75 for "Library."

Medical Officers and S.A.S. are kept informed by circular of additions to the libraries.

SCIENTIFIC PAPERS PUBLISHED BY MEMBERS OF THE STAFF IN 1922.

Case of Elephantiasis of the Vulva.—Journal Tropical Med. & Hygiene, March 1, 1922, by Dr. J. G. McNaughton.

Discovery of a New Breeding Place for Mosquitoes.—Trans. Roy. Society Trop. Med. & Hygiene (correspondence), Vol. 16, No. 3, p. 201, by Dr. W. E. Haworth.

CONFERENCE OF PRINCIPAL MEDICAL OFFICERS OF EAST AFRICAN COLONIES.

None was held in 1922; the last conference was held at Nairobi in December, 1920.

HOUSING OF OFFICIALS.

Government House was completed and His Excellency entered into residence there on his return from leave in November, 1922.

The construction of the four new two-storied houses in Dar-es-Salaam, referred to on p. 151 of the Annual Medical Report for 1921, was begun, and rapid progress toward completion was made in the latter part of the year. They are being constructed on an excellent plan, but the sites are, under existing conditions, not the most desirable. Work was commenced on the five two-roomed semi-detached bungalows. A number of European and many Asiatic officials, for whom Government quarters are not available, still draw housing allowance, but, by repairs and alterations to existing buildings, this number is being gradually reduced.

In some out-stations the accommodation, except for the most senior officials, is poor; a large building programme was provided for in the 1922/23 Estimates, and work has been commenced.

THE GINNERIES BOARD.

The Principal Medical Officer and Senior Sanitation Officer are members of this Board and the latter has referred to legislation affecting the Cotton industry on pp. 101 and 102 of his report. Sites for and plans of ginneries are submitted for approval. It is regrettable that the Germans permitted the erection of ginneries in the middle of townships, whence their removal is now almost impossible. The fact that none of these ginneries, or of the German godowns and customs sheds have been constructed on rat-proof principles is still more unfortunate; considerable expense will be involved in rat-proofing existing Government godowns, but, until this is done, private owners cannot be expected to incur heavy expenditure on alterations to buildings to which lapse of time has afforded sanction.

CENTRAL TOWN PLANNING AND BUILDING COMMITTEE.

The committee, of which the Principal Medical Officer is chairman, has been chiefly occupied with the drafting of new township rules for application to all townships in the Territory. The final draft was completed and submitted to the Solicitor-General for his comments in October.

Owing to difficulty in obtaining surveys, little progress has been made in deciding upon the lay out of townships. In this matter the committee is faced with very serious problems. Some of the conditions which were allowed to grow up during the German occupation render development on satisfactory lines almost impossible; during the war these conditions were aggravated. This remark applies principally to the business, Asiatic and native quarters; the European residential parts show that care was expended and good streets and roads exist. The Asiatic and native quarters often show but little regard to alignment and in some cases the sites of thoroughfares even have been built upon. The selection of sites for townships has often been bad and seems to have been determined solely by the existence of an Arab or native town; little regard to future development has been paid and the lay-out subordinated to the location of a fort-like Government building—for office and residential purposes—in a commanding position. The drainage arrangements, where in existence, are usually deplorably inefficient. That this was realised by the Germans is evidenced by the new building laws which came into force in July, 1914; elaborate lay out plans of some towns have been discovered and they show that drastic reforms were contemplated. The Committee has therefore a difficult problem ahead of it and the survey of the larger towns is an urgent matter, so that future mistakes may be avoided and a lay out allowing for development decided upon. The rectification of past mistakes must be a matter of years. The need for a whole-time Sanitary Engineer was mentioned in the Annual Report for 1921, p. 152.

The proposed sites of all new Government buildings come before the Committee for approval before submission to His Excellency; were the lay out of all townships settled this procedure would involve little discussion. As things are, it is sometimes necessary to consider the whole lay out of the townships before a decision can be reached. It is to be hoped that the care and consideration which the Central Committee gives to these questions will result in the adoption of their recommendations.

The local Town Planning and Building Committees are now provided with powers under the Township (Building) Rules to regulate building in the townships. But constant vigilance is required to ensure that the specifications are adhered to; in the larger townships a building inspector is required for this duty.

Director of Laboratory's Report.

The Report shows an increase in almost every direction in the number of routine examinations made. The volume of this work practically precludes research. During the absence on leave of the Director a substitute is found from the general staff of Medical Officers from which he can ill be spared; this arrangement presents very obvious disadvantages.

Even more urgent than the extension of the Laboratory buildings is the addition to the staff of an assistant bacteriologist and an entomologist; an analytical chemist will be essential as the country develops.

The slightly higher percentage of benign tertian infections found by examination of the blood of natives and Asiatics over that found in European cases is no doubt due to the number of Asiatics who reach the Territory already infected with the benign tertian parasite. The quartan parasite does not figure in the findings.

In table of diseases treated at the hospital, pp. 63-68, it has been considered better to make no attempt to differentiate, for the results are but infrequently based on microscopical examination and in some cases the recording officer's opinion on the type of parasite is not to be relied upon. The figures shown in the report of the Director of Laboratory give a more true indication of the percentages of the types of parasites responsible for malaria infection in the Territory.

PRESENT AND FUTURE SPHERES OF ACTIVITY.

The possibility of any extension of the activities of the Department is entirely dependent upon an increased provision of staff and funds. The prime duties of the department are to afford medical attention to Government employees and their families and to provide means for the prevention and suppression of serious infectious disease; the latter involves responsibilities to neighbouring countries as well as to the inhabitants of the Territory.

Table E of the Annual Medical Report, 1921, shows that more than two-fifths of the in-patients and one-third of the out-patients treated at Government Hospitals and Dispensaries were Government officials; convicts are not, of course, included under this heading. The missions working in the Territory employ some nurses and two medical men whose chief work is amongst the native population.

With a staff of three Senior Medical Officers and 21 Medical Officers the conditions of the service allow of about 17, under normal conditions, being available for duty, the rest being on ordinary or study leave or acting for members of the Administrative branch or Director of Laboratory while on leave. Actually, owing to the working off of arrears of leave, sickness and other reasons, the number has been rather less.

It is felt that the size, importance, potential unhealthiness and maritime communications of the capital and Tanga amply justify the employment of two whole-time Medical Officers of Health and a large proportion of the sanitary personnel at these two stations, leaving about 15 Senior Medical Officers and Medical Officers for medical, sanitary and special duties throughout the Territory, which, as previously remarked, is divided into 22 districts and 19 sub-districts. Indian Sub-Assistant Surgeons afford medical attention in a number of those districts and sub-districts for which no Senior

Medical Officer or Medical Officer is available; for many only an Asiatic compounder or native assistant is available.

Urgent as are the prosecution of investigations into and adoption of measures against endemic infectious disease amongst the native inhabitants, the provision of adequate medical attention for Government employees and convicts in every district and sub-district and of some sanitary organisation in the principal townships must take first place. A Medical Officer of Health for Tabora town and district, who will also be responsible for the sanitation of a considerable section of the Central Railway, is an urgent requirement at the moment.

Increases of staff are also needed for a fuller investigation into and measures against sleeping sickness, plague and other serious endemic disease in the Mwanza, Singida and South Western areas. The evidence of widespread infestation with ankylostomes of the native population of the north-eastern area calls for enquiry. Bukoba District, with a large percentage of its 320,100 inhabitants infected with venereal diseases, presents a field of work which one Medical Officer at the headquarters of the district assisted by a Sub-Assistant Surgeon and with diverse routine duties to discharge, can hardly touch. Our sanitation resources cannot be expended to the best advantage without the aid and advice of a medical entomologist nor can the Laboratory properly fulfil its function without increased personnel.

The statistics of the infantile mortality recorded on page 100 inspire the hope that the work of the Education Department will enable child welfare and maternity work to be taken up extensively in the future as in the Belgian Congo. A necessary preliminary is registration of births and deaths amongst all races in townships. A difficulty in medical work which constantly forces itself upon the attention is the poor standard of education of native hospital assistants; the best of our native staff comes from beyond the boundaries of the Territory. One looks forward to seeing a Native Medical Training School turning out numbers of reliable hospital assistants, but the material for training is not yet available.

To the writer the paramount importance of making every effort to promote the increase and health of the native population appears self-evident. Putting aside for the moment the humanitarian aspect of the question, it is an economic proposition. More than 32 per cent. of the total estimated revenue—excluding the Imperial Grant in Aid for 1922/23—is expected from house, hut and poll taxes. The development of the country, whether by cotton, fibre or coffee planting, depends upon the labour of the native.

With so many spheres for activity open it is no easy matter to adjudicate upon their relative urgency. In the following section the task is attempted.

RECOMMENDATIONS.

1. An organised staff of sanitary officers for public health duties in the larger townships and on the railway lines. Better sanitary work will be done by officers who are assured against liability to recall to ordinary medical duties.

2. Increase of the medical staff to provide (1) a district Medical Officer for each of the eighteen larger administrative districts; (2) Medical Officers for special duties in connection with epidemic diseases—plague, sleeping sickness, yaws, venereal disease.

3. The appointment of an Office Superintendent to the Principal Medical Officer's office where the volume of correspondence, much of it of a confidential nature, is very large. Proper records cannot be kept with the existing staff and the amount of detail work required of the Administrative Officers is very large.

4. Strengthening the staff of the Dar-es-Salaam Laboratory by the appointment of an Assistant Bacteriologist and a Medical Entomologist.

5. The replacement of grass and wattle and daub hospital wards by permanent structures and the provision of the latter in stations for which it is proposed to provide Medical Officers when the staff is augmented.

6. The reduction of vegetation, notably cocoanut, palms and heavy foliaged trees, in towns on the coast and in other unhealthy places. The clearing of old cocoanut palms from the Botanical Gardens, Dar-es-Salaam, is a measure which has been urged both by the Medical and Agricultural Departments from different points of view. The Botanical Gardens, Dar-es-Salaam, should be cleared to such an extent as to render them of value as an open space instead of, as now, acting as a nursery of and refuge for mosquitoes and a screen cutting off the sea breeze from residences.

7. Better facilities for the isolation of infectious disease in the principal settlements.

8. Registration of births and deaths, in all classes, in all townships.

9. The careful restriction of the number of returns required of members of the department specially on financial matters.

10. Whenever funds are available, two-storied houses, in preference to bungalows, should be erected for officials in stations with trying climates, such as the coast towns.

11. The appointment of a Building Inspector under the Dar-es-Salaam Township Authority.

12. The appointment of a Surgeon Specialist for headquarters.

J. B. DAVEY,

Principal Medical Officer, Tanganyika Territory.

TANGANYIKA TERRITORY.

Annual Medical Report

For the Year ended 31st December, 1922.

SECTION I.

ADMINISTRATIVE.

(*a*)—STAFF.

(1) The establishment as authorised by the Estimates, 1921-22, was as follows :—

EUROPEAN.

Principal Medical Officer.
Deputy Principal Medical Officer.
Senior Sanitation Officer.
Director of Laboratory.
3 Senior Medical Officers.
1 Dental Surgeon.
23 Medical Officers.
2 Senior Nursing Sisters.
14 Nursing Sisters.
1 Clerk.
1 Storekeeper.
1 Laboratory Assistant.
1 Superintendent, Lunatic Asylum
1 Matron, Lunatic Asylum.
7 Sanitary Superintendents.

ASIATICS.

23 Sub-Assistant Surgeons.
26 Compounders.
1 2nd Grade Clerk.
7 3rd and 4th Grade Clerks.

NATIVES.

A varying number of Native Clerks, Hospital Attendants, Dispensers, Sanitary Inspectors, Vaccinators and Labourers.

(2) For the year 1922-23 the establishment was reduced by :—

Europeans.	*Asiatics.*
2 Medical Officers.	2 3rd Grade Clerks.

But the following additional appointments were authorised :—

Europeans.	*Asiatics.*
1 Assistant Medical Storekeeper.	1 2nd Grade Clerk.

(3) Shortages on establishment :—

At the beginning of the year there were the following shortages on Establishment :—

Europeans.	*Asiatics.*
3 Medical Officers.	2 Sub-Assistant Surgeons.
2 Sanitary Superintendents.	3 Compounders.

Of the three vacancies for Medical Officers one was filled from England in March; the other two were unfilled and the establishment, as already stated, was reduced on April 1st, 1922, by two.

Of the two vacancies for Sanitary Superintendents one was filled from England in January and one was filled locally by a temporary appointment.

The Assistant Medical Storekeeper arrived in Dar-es-Salaam on October 5th, 1922. The additional appointment of 2nd Grade Asiatic Clerk was filled by the promotion of Mr. A. L. B. Fernandes from the 3rd Grade. The vacancies for the Sub-Assistant Surgeons and Compounders were filled during the year.

N.B.—The shortages due to absence on leave are not included in the above.

The post of the Senior Sanitation Officer became vacant on July 21st, 1922, by the reversion to the Army of Lieut.-Colonel D. S. Skelton, D.S.O., R.A.M.C., who proceeded on leave in March, 1922. Dr. Owen Prichard, Senior Medical Officer, acted as Senior Sanitation Officer from March to October, when he was appointed Acting Deputy Principal Medical Officer. The appointment of Senior Sanitation Officer remained unfilled until December 11th, 1922, when Dr. A. H. Owen, Senior Medical Officer, Uganda, was appointed. He arrived in Dar-es-Salaam on December 26th, 1922.

No Entomologist as Assistant Bacteriologist or Office Superintendent is attached to the Department.

The establishment of Medical Officers is inadequate. There are 22 districts and 19 sub-districts in the Territory, which has an area exceeding that of Kenya and Uganda combined. The number of Senior Medical and Medical Officers available for general medical duties in the Territory has been, on the average, 14.

The Medical Officers of Health are drawn from the general staff of Medical Officers and are stationed at Dar-es-Salaam and Tanga; elsewhere their duties are performed by the Medical Officer or Sub-Assistant Surgeon of the station.

During the absence on leave of the Director of the Laboratory his post was filled by a temporary Medical Officer with Public Health qualification.

One Medical Officer has been engaged in plague work in Singida sub-district throughout the year. For eight months one Medical Officer has been principally engaged in sleeping sickness work, but has also had medical charge of an important district.

The distribution of the staff in the various districts is shown on pp. 34 and 35.

(4) APPOINTMENTS, CHANGES, ETC., IN STAFF.

Appointments :—

Dr. A. H. Owen (S.M.O., Uganda Medical Service), Senior Sanitation Officer	11/12/22
Dr. J. M. Semple, Medical Officer	23/3/22
Dr. A. I. Meek, ,, ...	5/5/22
Dr. J. J. B. Edmond, ,, ...	30/6/22
Miss B. G. Allardes, Nursing Sister	26/1/22
Miss M. B. H. Macrae, ,, ,, ...	28/6/22
Miss M. H. Sanders, ,, ,, ...	23/3/22
Miss Z. E. Angus, ,, ,, ...	23/3/22
H. W. Hassard, Assistant Medical Storekeeper ...	7/9/22
J. S. Humphrey, Second Grade Sanitary Superintendent	26/1/22
R. Baxter, Sub-Assistant Surgeon	1/3/22
R. R. Pagadala, Sub-Assistant Surgeon	16/11/22
G. V. Sakrikar, ,, ,, ...	25/6/22
Jagat Singh, Compounder	8/8/22
Aziz Ahmed, ,, ...	29/5/22
J. Rego, ,, ...	29/5/22
P. D'Mello, Fourth Grade Clerk	1/2/22

Promotions :—

Mr. W. A. Moore, Second Grade Sanitary Supt. to be First Grade Sanitary Supt. with effect from...	19/10/21
Mr. A. L. B. Fernandes, Third Grade Asiatic Clerk, to be Second Grade.	

Agreements expired :—

European.

Lt.-Col. D. S. Skelton, S.S.O.
Dr. N. L. Richards, Med. Officer (temp.)
Dr. C. W. Breeks, ,, ,,
Dr. J. G. McNaughton, ,, ,,
Mr. C. W. Strutt, Sanitary Supt.
Miss N. W. Evans, Nursing Sister.
Miss M. Donald, ,, ,,

Asiatic.

N. M. Kadhe, Sub-Asst. Surgeon.
Abdul Hakim, Compounder
S. C. Sen, ,,
Daya Ram, ,,
Mhd. Shaif. U. Khan, Compounder.
B. P. Trivedi, S. A. S.
Jai Singh, Compounder.

Resignations :—

European.

Miss J. P. Stow, Senior Nursing Sister.
Miss E. K. Lepp, Nursing Sister.
Miss E. Walton, ,, ,,

Asiatic.

E. S. H. Pereira, Fourth Grade Clerk.

Retirements :—

Nil.

Re-appointed :—

Miss M. Donald, Nursing Sister.
Dr. J. G. McNaughton, Temp. M.O.

Invalidings :—

Europeans.

Dr. J. S. Macdonald.
Miss E. M. Whitehouse.

Asiatics.

Nil.

Deaths :—

Europeans.

Nil.

Asiatics.

Compounder Misri Khan.

(5) LEAVE :—

The following were on leave during the period stated opposite their names :—

	From	To
J. B. Davey, Principal Medical Officer ...	Beginning of year.	7/8/22
J. O. Shircore, Dp. Principal Medical Officer	27/10/22	End of year.

	From	To
D. S. Skelton, Lt.-Col., D.S.O., R.A.M.C., S.S.O.	19/3/22	20/7/22
G. G. Butler, Director of Laboratory	24/2/22	10/9/22
C. R. Wallace, Medical Officer	19/4/22	End of year.
G. R. C. Wilson, ,, ,,	12/8/22	,, ,,
R. R. Scott, ,, ,,	13/5/22	,, ,,
J. G. NcNaughton, Temp. Medical Officer	15/7/22	,, ,,
J. S. Macdonald, ,, ,, ,,	28/11/22	,, ,,
C. W. Breeks, ,, ,, ,,	8/5/22	28/7/22
Miss E. M. Whitehouse, Nursing Sister	27/10/22	End of year.
Miss S. Riordan, ,, ,,	17/3/22	1/10/22
Miss J. Fraser, ,, ,,	25/1/22	7/8/22
Miss N. W. Evans, ,, ,,	Beginning of year.	28/2/22
Mrs. M. A. Cartlidge, ,, ,,	,, ,,	28/4/22
Miss M. Donald, ,, ,,	,, ,,	6/2/22
C. W. Strutt, Sanitary Superintendent	13/5/22	22/10/22
W. A. Moore, ,, ,,	Beginning of year.	22/2/22
R. E. Owen, ,, ,,	1/5/22	1/12/22
J. De Souza, Second Grade Clerk, P.M.O.'s Office	Beginning of year.	5/3/22
Habib Ullah Khan, Compounder	21/11/22	End of year.
M. M. Dass, ,,	3/11/22	,, ,,
S. C. Mazumdar, ,,	27/9/22	,, ,,
L. Maria Dass, ,,	22/12/22	,, ,,
J. C. X. Rodrigues, ,,	Beginning of year.	7/1/22
Abdul Satar Khan, ,,	28/9/22	24/12/22
Mhd. Shaif Ullah Khan, ,,	18/7/22	End of year.
E. Dias, ,,	Beginning of year.	2/4/22
B. G. Pandit, Sub-Assistant Surgeon	,, ,,	24/6/22
J. N. Sen Gupta, ,, ,,	,, ,,	2/4/22
B. P. Trivedi, ,, ,,	3/7/22	End of year.
Y. L. Moole, ,, ,,	Beginning of year.	29/4/22
C. K. Borsada, ,, ,,	5/12/22	End of year.
M. N. Kadhe, ,, ,,	29/9/22	,, ,,

(6) At the end of December, 1922, the staff was distributed as follows :—

Name and Qualifications.	Rank of Appointment.	Where Stationed.	Remarks.
J. B. Davey, M.B. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.T.M. (Liverp.).	Principal Medical Officer	Dar-es-Salaam.	—
J. O. Shircore, M.B., Ch.B. (Edin.), L.R.C.P., L.R.C.S., L.F.P.S. (Edin. & Glas.), M.R.C.P. (Edin).	Deputy P.M.O.	On leave	—
A. H. Owen, B.A. (Camb.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.T.M. & H. (Camb.)	S.S.O. ...	Dar-es-Salaam.	—
W. Owen Prichard, L.R.C.P., L.R.C.S., L.F.P.S. (Edin. & Glas.).	S.M.O. ...	,, ,,	Act. D.P.M.O.
G. G. Butler, M.B.E., M.R.C.S. (Eng.), L.R.C.P. (Lond.). M.D., B.Ch. (Camb.).	Director of Laboratory.	,, ,,	—
T. H. Suffern, M.B., B.A.O., Ch.B. (R.U.I.).	S.M.O. ...	Tanga ...	—
C. L. Ievers, L.R.C.S., L.R.C.P., L.R.F.P.S. (Edin. & Glas.), D.T.M. (Liverp.).	,, ...	Tabora ...	—
J. McK. Clark, M.B., B.Ch., (Aberd), D.T.M. (Liverp.).	Medical Officer.	Kigoma ...	—
C. R. H. Tichborne, L.A.H. (Dub.).	,, ,,	Mahenge	—
C. R. Wallace, L.R.C.P., L.R.C.S., L.M. (Ireland).	,, ,,	On leave	—
D. S. Scott, M.B., Ch.B. (Aberd.), D.T.M. (Lond.).	,, ,,	Dodoma ...	—
G. R. C. Wilson, M.R.C.S.(Eng.), L.R.C.P. (Lond.).	,, ,,	On leave.	—
C. B. B. Reid, M.B., Ch.B. (Edin.).	,, ,,	Tukuyu ...	—
R. R. Scott, M.C., M.R.C.S. (Eng.), L.R.C.P. (Lond.).	,, ,,	On leave	—
J. H. Parry, B.A. (Camb.), M.R.C.S. (Eng.), L.R.C.P. (Lond.).	,, ,,	Dar-es-Salaam.	—
A. McA. Blackwood, M.B., Ch.B. (Glas.).	,, ,,	Kigoma ...	Off duty on account of sickness.
W. E. Haworth, M.B., C.M., B.Sc. (Edin.).	Temp. Medical Officer.	Lindi ...	—
J. M. Semple, B.Ch., M.B., B.A.O. (Dub.) & L.M. (Rot.).	Medical Officer.	Dar-es-Salaam.	—
J. S. Macdonald, L.R.C.P., L.R.C.S., L.F.P.S. (Edin. & Glas.).	,, ,,	On leave	—
J. A. H. Vanderwert, L.R.C.P., L.R.C.S. (Edin. & Glas.).	,, ,,	Songea ...	—
J. G. McNaughton, M.D., C.M., M.R.C.P. (Edin.).	Temp. Medical Officer.	On leave	—
C. H. Philips, L.M.S.S.A. (Lond.)	Medical Officer.	Singidda ...	Plague duty.

Name and Qualifications.	Rank of Appointment.	Where Stationed.	Remarks.
G. A. Williams, L.R.C.P.(Lond.), M.R.C.S. (Eng.).	Temp. Medical Officer.	Bukoba ...	—
G. Maclean, M.B., Ch.B. (Glas.)	Medical Officer.	Mwanza	—
C. F. Shelton, M.D. (Lond), L.R.C.P. (Lond.), M.R.C.S. (Eng.).	,, ,,	Arusha ...	—
R. Nixon, M.B., Ch.B., D.T.M., D.P.H. (Liv.).	,, ,,	Dar-es-Salaam.	Acting M.O.H.
J. J. B. Edmond, M.B., Ch.B. (Edin.).	,, ,,	Moshi ...	—
A. I. Meek, L.R.C.P., L.R.C.S., L.R.F.P.S., D.P.H. (Edin. & Glas.).	,, ,,	Tanga ...	Acting M.O.H.
H. M. Fisher, L.D.S., R.C.S. (Eng.).	Dental Surgeon.	Dar-es-Salaam.	—
Miss F. M. Plant	Senior Nursing Sister.	Tanga ...	—
Miss E. L. Kemsley, R.R.C. ...	Nursing Sister	Dar-es-Salaam.	—
Mrs. M. A. Cartlidge ..., ...	,, ,,	Moshi ...	—
Miss J. Fraser	,, ,,	Tabora ...	—
Miss S. Riordan	,, ,,	Mwanza	—
Miss E. M. Whitehouse... ...	,, ,,	On leave	—
Miss M. E. Shearing	,, ,,	Tanga ...	—
Miss W. R. Grant	,, ,,	,, ...	—
Miss E. Bishop	,, ,,	Dar-es-Salaam.	Acting S.N.S.
Miss N. E. Wells	,, ,,	,, ,,	
Miss B. G. Allardes	,, ,,	,, ,,	—
Miss Z. E. Angus	,, ,,	,, ,,	—
Miss M. H. Sanders	,, ,,	,, ,,	—
Miss M. B. H. Macrae	,, ,,	Tabora ...	—
Miss M. Donald...	,, ,,	Not yet arrived.	—
Mr. C. D. Dovey	Medical Storekeeper.	Dar-es-Salaam.	—
Mr. H. W. Hassard	Asst. do.	,, ,,	—
Mr. J. L. Mason	Clerk P.M.O.'s Office.	,, ,,	—
Mr. H. Hammond	Laboratory Assistant.	,, ,,	—
Mr. J. Spittles	Supt. Lunatic Asylum.	Lutindi ...	—
Mrs. C. M. Spittles	Matron do.	,, ...	—
Mr. C. N. Rowe	1st Grade San. Supt.	Sar-es-Salaam.	—
Mr. W. A. Moore	,, ,,	Tabora ...	—
Mr. R. E. Owen	2nd Grade San. Supt.	Dar-es-Salaam.	—
Mr. T. Bell	,, ,,	Tanga ...	—
Mr. J. S. Humphrey	,, ,,	,, ...	—
Mr. F. A. Gemmell	,, ,, (temp.) (Engaged locally).	Dar-es-Salaam.	—

(*b*)—FINANCIAL.

Estimated expenditure for period 1st January to 31st December, 1922 :—

MEDICAL DIVISION.	
Personal Emoluments :—	£
Principal Medical Officer and Deputy Principal Medical Officer	2,200
Clerical Staff, Medical Storekeepers, Packers, Messengers, etc.	2,117
Senior Medical Officers	2,537
Medical Officers	11,550
Dental Surgeon	744
	£19,148
SANITATION DIVISION.	
Senior Sanitation Officer, Medical Officers of Health and Subordinate Staff for the suppression of Epidemic Diseases	6,010
LABORATORY DIVISION.	
Director of Laboratory and Laboratory Assistant	1,219
Total Personal Emoluments	£26,377

Other Charges :—	
ADMINISTRATIVE DIVISION.	£
Incidental charges	165
MEDICAL DIVISION.	
General Miscellaneous	5,225
SANITATION DIVISION.	
For dealing with Venereal Diseases	43
Maintenance of Lepers, Lunatics and Incurables	4,291
Sanitary Labour and Upkeep of I.D. Hospital	11,533
Miscellaneous	617
LABORATORY DIVISION.	
Miscellaneous	418
Total other charges	£22,292

SPECIAL EXPENDITURE.

	£
Equipment for Treatment of Venereal Diseases	145
Sanitary Equipment	2,037
Travelling Equipment	80
Medical Library	114
	£2,376

HOSPITALS AND DISPENSARIES.

Personal Emoluments:—

	£
Nursing Staff	3,135
Superintendent and Matron Lunatic Asylum	560
Indian Medical Assistants	9,917
Native Dispensers, Hospital Attendants and Dressers ...	3,591
	£17,203

Other Charges:—

Medical and Surgical Stores	4,070
Medical Equipment and Furniture	1,028
Upkeep of Hospitals	10,667
Miscellaneous Charges	530
	£16,295

STATEMENT OF REVENUE, 1922.

	£
From Hospital Fees and Sale of Drugs, etc.	4,325
Fees collected by Port and Marine Department for Bills of Health	445
Sale of Vaccine to Zanzibar Government	257
	£5,027

SECTION II.

HEALTH OF THE POPULATION.

(*a*)—EUROPEAN OFFICIALS.

THE DEATHS OF EUROPEAN OFFICIALS WERE DUE TO :—

	1921.	1922.
Cerebro-Spinal Meningitis	0	1
Influenza	0	1
Malaria	1	1
Blackwater Fever	1	1
Aortic Disease, Angina Pectoris, Cardiac Failure	0	1
Cardiac Failure	1	0
Gastro-enteritis	0	1
Chronic Nephritis	1	0
Total ...	4	6

INVALIDINGS.

Medical Boards were held on 17 European Officials. Ten were permanently invalided from the service on account of :—

Enteric Fever	1
Malaria	2
Blackwater Fever	1
Tuberculosis	1 (since died)
General Debility	2
Psychasthenia	1
Endarteritis obliterans	1
Loss of Vision	1
Total ...	10

The remainder, and one official who was sent home on medical certificate, were invalided home (3) or allowed to resume duty after local sick leave (5) the causes of sickness being :—

Amœbiasis and Hepatitis	1
Malaria	2
Blackwater Fever	3*
Mental Depression	1
Debility	1
Total ...	8

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* In one case, attack of Blackwater Fever occurred in December, 1921, and patient was invalided in January, 1922.

TABLE A.

SICK, INVALIDING AND DEATH RATES, EUROPEAN OFFICIALS, 1921 AND 1922.

	Dar-es-Salaam.		Tabora.		Tanga.		Whole Territory.	
	1921	1922	1921	1922	1921	1922	1921	1922
1. Total number of Officials Resident ...	300	418	55	86	C	94	559B	836D
2. Average number Resident	252	260	55	56	C	56	538B	656D
3. Total number on Sick List	274	327	36A	87	23	42	440A	618E
4. Total number of days on Sick List ...	2,179	2,115	307A	449	296	260	3,859A	4,245E
5. Average daily number on Sick List ...	5·97	5·79	·84A	1·23	·81	·71	10·57A	11·63
6. Percentage of Sick to average number Resident	2·37A	2·23	1·53A	2·20	—	1·27	1·96	1·77
7. Average number of days on Sick List for each patient	7·95	6·47	8·53A	5·16	12·87	6·19	8·77	6·87
8. Average Sick Time to each resident ...	8·65	8·13	5·58A	8·02	—	4·64	7·17	6·47
9. Total number Invalided	2	6	—	1	—	—	9	13D
10. Percentage of Invalidings to total Residents	·66	1·44	—	1·16	—	—	1·61	1·56
11. Total deaths	3	4	1	—	1	—	5	6D
12. Percentage of Deaths to total Residents	1·0	·96	1·82	—	—	—	·89	·72
13. Percentage of Deaths to average number Resident	1·19	1·54	1·82	—	—	—	·93	·91
14. Number of Cases of Sickness contracted away from Station	—	—	1	—	—	—	—	—

A.—Figures for 1921 taken from Annual Medical Report, 1921, with some amendments.

B.—From 14 stations shewn in Report, 1921. Census 1921 gives 621 European Officials on 24th April, 1921.

C.—Figures not available, the Census, 1921, shews 59 European Officials at Tanga: the answers to questions, 6, 8 and 13, calculated on this figure, would be 1·37, 5·02 and 1·69 respectively.

D.—For whole Territory: compiled from staff records.

E.—From 17 stations for which returns are available, viz.:—Dar-es-Salaam, Dodoma, Tanga, Tabora, Iringa, Mikindani, Lindi, Kilwa, Bukoba, Utete, Kilossa, Pangani, Arusha, Songea, Mwanza, Tukuyu, Bagamoyo; the answers to questions 5 to 8 are calculated from these figures, the answers to remaining questions are calculated on number of officials resident in whole Territory (*i.e.*, answers to questions 1 and 2).

(*b*)—EUROPEAN NON-OFFICIALS.

The death returns of unofficial Europeans are probably incomplete, 30 are known to have died during the year, the causes of death being :—

Enteric Fever	1
Influenza	4
Malaria (cerebral)	2
Chronic Malaria	2
Blackwater Fever	5
Measles	1
Pneumonia (lobar)	1
Rheumatic Fever	1
Tuberculosis	1
Senile Decay	1
Bulbar Paralysis	1
Paralysis	1
Atheroma of Coronary Artery	1
Chronic Myocarditis	1
Heart Failure	2
Bronchitis	1
Diarrhœa	1
Strychnine Poisoning	1
Unknown	2
	30

The census of 1921 gives the non-official European population as 1,826.

The number of cases treated at Government Hospitals and Dispensaries during the year was 363 in-patients, 688 out-patients.

(*c*)—ASIATIC OFFICIALS.

The following table shows the sick, invaliding and death rates of Asiatic officials during 1922 :—

Total number of officials resident	756
Average number resident	664
Total number on sick list	1,898
Total number of days on sick list	7,565

Average daily number on sick list	20·73
Per cent. of sick to average number resident	3·26
Average number of days on sick list for each patient	3·99
Average sick time to each resident	11·91
Total number invalided	6
Per cent. of invalidings to total residents	0·88
Total deaths	9
Per cent. of deaths to total residents	1·33
Per cent. of deaths to average number resident	1·42
Number of cases of sickness contracted away from station	—

The answers to the questions relate to fourteen of the principal stations only; returns from other stations are not available.

In the whole Territory there were 9 deaths amongst Asiatic officials during 1922, the causes of death being:—

Malaria (cerebral)	2
Chronic Malaria	1
Plague	1
Blackwater Fever	1
Pneumonia	2
Cerebral Hæmorrhage	1
Nephritis	1

INVALIDINGS.

Twelve medical boards were held and 6 officials were invalided out of the service for the following diseases:—

Malaria	2
Tuberculosis	1
Paralysis	1
Diabetes	2

The remaining six suffered from:—

Malaria	1
Blackwater Fever	1
Syphilis	1
Impaired vision	1
Other diseases	2

Three were returned to duty and three were sent on sick leave. The 1921 census reported that there were 804 Asiatic officials in the Territory.

TABLE B.

Sick, Invaliding and Death Rates, Asiatic Officials, 1921 and 1922.

	Dar-es-Salaam.		Tabora.		Tanga.		Whole Territory.	
	1921B	1922	1921	1922	1921	1922	1921	1922
1. Total number of Officials Resident ...	509	463C	190	113C	—	197C	796D	756E
2. Average number Resident	425	347C	172	85C	—	148C	645D	664E
3. Total number on Sick List	188	983	201A	473	99	265	570A	1,898E
4. Total number of days on Sick List ...	1,231	3,345	1,162A	1,931	1,238A	1,558	4,083A	7,565E
5. Average daily number on Sick List ...	3·4	9·1	3·2A	5·3	3·4	4·3	11·2A	20·7
6. Percentage of sick to average number Resident	·8A	2·8	1·9A	4·0	—	5·3	1·7A	3·1
7. Average number of days on Sick List for each Patient	6·5	3·4	5·8A	4·0	12·5A	5·9	7·2A	3·9
8. Average sick time to each Resident ...	2·9	9·6	6·8A	14·4	—	19·5	6·3A	11·4
9. Total number Invalided	1	2	—	—	—	1	5	6
10. Percentage of Invalidings to total Residents	·19	·4	—	—	—	·5	·6	·6F
11. Total Deaths	1	1	—	1	—	2	9	9
12. Percentage of Deaths to total Residents	·2	·2	—	·9	—	1·0	1·1	·8F
13. Percentage of Deaths to average number Resident	·2	·3	—	1·2	—	1·3	1·4	1·1F
14. Number of cases of Sickness contracted away from residence	—	—	—	—	—	—	—	—

A.—Figures for 1921 from Annual Medical Report 1921, amended where necessary information is available.

B.—The *sickness* returns for 1921 refer only to cases treated at the European Hospital, whereas the numbers resident refer to the total Asiatic population. For the two hospitals at Dar-es-Salaam combined, the answer to question 4, for the 6 months July-December, 1921, is 1,463 days; figures for the first six months of the year are not available from the Sewa Hadji Hospital. The figures for 1922 refer to both hospitals.

C.—From 1921 Census. Total resident estimated by adding 33⅓ per cent. Approximate only.

D.—For eleven stations shewn in Table " C," Annual Medical Report, 1921. Tanga is not included.

E.—From fifteen stations from which returns received, viz.:—Dar-es Salaam, Tabora, Mwanza, Kilwa, Bukoba, Utete, Kilossa, Pangani, Dodoma, Iringa, Tanga, Mikindani, Lindi, Tukuyu and Bagamoyo.

F.—Calculated on 1921 Census—804 Asiatic Officials; total resident estimated by adding 33⅓ per cent.

TABLE C.

SHEWING MORBIDITY RATES FOR MALARIA AND BLACKWATER FEVER AMONGST OFFICIALS, DAR-ES-SALAAM.

	EUROPEAN OFFICIALS.						ASIATIC OFFICIALS.					
	Total days off duty		Days off duty for Malaria		Days off duty for B.W. Fever		Total days off duty		Days off duty for Malaria		Days off duty for B.W. Fever	
	1921	1922	1921	1922	1921	1922	1921	1922	1921	1922	1921	1922
January	241	178	86	40	—	—	165	330	45	184	—	—
February	140	180	80	19	—	—	69	315	31	92	—	10
March	137	241	36	82	—	12	—	375	—	138	—	15
April	137	152	56	71	—	—	59	244	28	93	17	—
May	219	218	46	92	—	1	66	316	31	203	—	—
June	268	266	155	90	10	—	54	398	43	228	—	7
July	132	237	74	75	—	32	174	311	126	176	—	10
August	113	102	47	18	—	19	202	213	96	94	17	—
September	230	107	107	42	—	—	210	158	97	47	—	—
October	117	123	11	18	—	—	228	175	97	57	—	—
November	121	203	19	60	18	42	272	231	122	83	—	7
December	109	108	13	40	13	18	377	279	251	128	7	—
TOTAL	1,964	2,115	730	647	41	124	1,876	3,345	967	1,523	41	49

Percentage of days off duty for Malaria and Blackwater Fever to total days off duty:
1921—39·26
1922—36·45

Percentage of days off duty for Malaria and Blackwater Fever to total days off duty:
1921—53·73
1922—47·02

Returns for Europeans incomplete from Sewa Hadji Hospital.
For 1921 no returns are available from the Sewa Hadji Hospital for the first six months of the year for Asiatics and none for Europeans for any part of the year.

TABLE D.

SHEWING MORBIDITY RATES FOR MALARIA AND BLACKWATER FEVER AMONGST OFFICIALS, TANGA.

	European Officials.						Asiatic Officials.					
	Total days off duty		Days off duty for Malaria		Days off duty for B.W. Fever		Total days off duty		Days off duty for Malaria		Days off duty for B.W. Fever	
	1921	1922	1921	1922	1921	1922	1921	1922	1921	1922	1921	1922
January	13	27	5	—	—	—	139	56	18	51	—	—
February	29	24	2	16	—	—	181	124	23	65	15	—
March	96	24	5	20	—	—	189	200	18	55	39	—
April	57	18	13	3	—	—	141	123	43	57	36	—
May	24	45	10	32	—	—	144	181	23	105	13	—
June	9	16	6	16	—	—	74	122	48	56	—	—
July	23	32	14	21	—	—	107	194	47	132	—	—
August	4	20	4	15	—	—	58	148	19	66	—	—
September	18	32	—	9	19	—	85	93	9	39	—	—
October	9	9	9	4	—	—	50	91	16	40	—	—
November	—	3	—	1	—	—	44	84	8	35	—	—
December	14	10	11	3	3	—	26	142	—	66	—	—
TOTAL	296	260	79	140	22	—	1,238	1,558	272	767	103	—

European Officials: Percentage of days off duty for Malaria and Blackwater Fever to total days off duty:

1921—34·12
1922—53·85

Asiatic Officials: Percentage of days off duty for Malaria and Blackwater Fever to total days off duty:

1921—30·29
1922—49·23

TABLE E.

SHEWING MORBIDITY RATES FOR MALARIA AND BLACKWATER FEVER AMONGST OFFICIALS, TABORA.

	EUROPEAN OFFICIALS.						ASIATIC OFFICIALS.					
	Total days off duty		Days off duty for Malaria		Days off duty for B. W. Fever		Total days off duty		Days off duty for Malaria		Days off duty for B.W. Fever	
	1921	1922	1921	1922	1921	1922	1921	1922	1921	1922	1921	1922
January	20	32	—	11	—	—	68	115	24	103	—	—
February	40	10	—	9	—	—	67	187	47	146	—	—
March	17	21	—	11	—	—	221	231	104	149	—	—
April	77	39	—	9	—	—	90	210	35	120	—	—
May	17	73	6	63	—	—	86	289	46	182	—	9
June	2	51	—	42	1	—	128	247	33	158	—	19
July	26	30	—	12	22	—	17	167	8	140	—	—
August	13	28	—	16	—	—	43	88	—	77	—	—
September	58	26	33	6	—	—	126	87	44	63	—	—
October	10	41	8	11	—	—	102	15	47	6	—	—
November	21	74	16	7	—	—	97	164	26	96	—	—
December	6	24	5	13	—	—	117	131	79	51	—	—
TOTAL	307	449	68	210	23	—	1,162	1,931	493	1,291	—	28

European Officials	Asiatic Officials
Percentage of days off duty for Malaria and Blackwater Fever to total days off duty: 1921—29·64 1922—46·77	Percentage of days off duty for Malaria and Blackwater Fever to total days off duty: 1921—42·43 1922—66·86

(*d*)—REPORT ON THE HEALTH OF THE NATIVE POLICE AND WARDERS.

Strength of the Force (Africans)	2,205
Deaths in 1922	15
Death Rate	6·8 per 1,000

The deaths were due to :—

Dysentery	1
Malaria	2
Plague	2
Pneumonia	4
Tuberculosis (Pulmonary)	1
Heart Failure	1
Pleurisy	1
Diarrhœa	1
Peritonitis	1
Cirrhosis of Liver	1
	15

There was no special incidence of sickness or mortality at any particular station except at Morogoro where there were four deaths (dysentery, diarrhœa, peritonitis and heart failure) out of a strength of 235. The Central Training Depôt is located at Morogoro and three of these four deaths occurred amongst the men under training. The two deaths from plague occurred in the plague area of the Dodoma District.

Complete sick returns for the police are not available, for the Force is distributed throughout the Territory, and at many of the smaller stations the Medical Department is represented by an Indian Compounder or a native dresser only. For some of the information contained in this Report I am indebted to the Commissioner of Police and Prisons.

From eleven* stations detailed returns of the cases treated have been received; they refer to a total strength of about 550 police and warders. The important diseases treated among these men comprise :—

Dysentery	8
Influenza	17
Malaria	169
Malta Fever	1
Pneumonia	4
Tick Fever	2

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* Tabora, Kigoma, Mahenge, Bagamoyo, Kilwa, Kondoa-Irangi, Arusha, Iringa, Utete, Mikindani, Tunduru.

Tuberculosis	1
Yaws	1
Venereal Diseases—Syphilis, 24; Gonorrhœa, 24; Other, 5	53
Scurvy	1
Bronchitis	57
Diarrhœa	20

The reports from Bukoba and Dar-es-Salaam are not included above, for they do not give numbers. The former mentions that "large numbers of venereal diseases and malaria cases" were treated, the latter, that of the patients drawn from the police:—

36 per cent. were cases of malaria.
7 per cent. were cases of venereal diseases.
4·5 were cases of ulcers.

Malaria and venereal diseases are mainly responsible, as far as disease is concerned, for inefficiency. The police are, of course, a picked body of men in the prime of life; they are well fed and clothed and live under better hygienic conditions than the average native; their health has, on the whole, been satisfactory. At stations where a Medical Officer or Sub-Assistant Surgeon is available a weekly medical inspection is the rule.

(e)—REPORT ON THE HEALTH OF PRISONERS.

The general health of prisoners has been good; the physical condition of the majority of short sentence convicts improves very appreciably during imprisonment owing to the good food and the regular hours of labour and rest.

Conditions of Life.

In nearly all prisons the convicts sleep in association cells. The hours allotted to sleep vary from 9 to 12.

The provision as regards beds varies, some prisons having plank bedsteads or wooden platforms, while in most instances the prisoners sleep on mats on the floor. Where the cell floors are dry and well cemented I consider that the last mentioned arrangement is to be preferred. It is practically impossible to keep wooden beds or platforms free of bugs, and in some districts they become infested also with *Ornithodorus moubate*. Mats can be kept vermin free quite readily by a daily airing in the sun. It is no hardship to the vast majority of natives to sleep on a hard surface.

Diet.

At nearly all prisons three meals a day are provided; their composition varies according to the resources of the district, but the allowance is quantitatively ample.* Difficulty sometimes arises in obtaining fresh foods, but the importance of doing so is generally realised.

Labour.

In addition to carrying out the essential domestic work of the prison, bringing firewood and water, cleaning the cells and yard, etc., prisoners are employed in Government works, such as building, road repairs, grass cutting, bush clearing and sanitary work. At some prisons elaborate structural alterations have been carried out by the prisoners under the supervision of the gaolers. In Tanga and Mwanza gaols soap is made in sufficient quantity to supply the needs of the prisons throughout the Territory. Tailoring of a simple kind is performed at Dar-es-Salaam, Tabora, Tanga, Lindi, Mwanza and Dodoma gaols. Prison gardens are attached to many prisons to supply food to convicts. The Commissioner of Police and Prisons has always lent a ready ear to the requests of the sanitary section of the Medical Department for prison labour.

Sickness Returns.

Complete returns are not available at the time of writing for Songea, Pangani and Bukoba prisons. For the remainder the following statistics have been compiled partly from the Annual Reports of the Medical Officers and Sub-Assistant Surgeons and partly from information kindly supplied by the Commissioner of Police and Prisons:—

Total number of persons committed to gaol during the year 1922	6,605
Average daily number of prisoners	1,397·57
Average daily number on the sick list	86·53
Percentage of sick to average number of prisoners ...	6·19
Number of admissions to hospital	563
Total number of deaths	51
Percentage of deaths to average number of prisoners	3·65
Percentage of deaths to total number committed to gaol in 1922	0·77

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* See Diet scale at end of report.

The principal causes of sickness were :—

Malaria.
Influenza.
Bronchitis.
Venereal disease.
Ankylostomiasis.

The deaths were due to :—

Dysentery	1
Influenza	1
Malaria (cerebral)	1
Pneumonia	10*
Tuberculosis	5*
Pellagra	1
Meningitis (pneumococcic)	1
Heat Stroke	1
Epilepsy	1
Mania	1*
Arteriosclerosis	1
Aneurysm	1
Cardiac Disease	1
Bronchitis	4
Chronic Pneumonia	1
Broncho-pneumonia	2
Emphysema	1
Hæmothorax	1
Pleural Effusion	1
Gastritis	1
Diarrhœa	1
Peritonitis	1
Ischiorectal Abscess	1
Cystitis	1
Arthritis (gonorrhœal)	1
Arthritis (rheumatoid)	1
Ankylostomiasis	3
Misadventure	2
Other causes	3
	51

Coroners' inquests were held in all but nine instances, the verdict in every case being death from natural causes.

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* One case of pneumonia, one case of tuberculosis and the case of mania were insane when admitted to prison.

It should be remarked that, of the 32 prisons for which statistics are furnished, 13 are at stations where no Medical Officer or Sub-Assistant Surgeon is posted.

Of the 51 deaths, 18 were recorded from Mwanza gaol where there was a daily average of 109 prisoners. The deaths were due to:—

Influenza	1	Gastritis	1
Pellagra	1	Ischiorectal Abscess ...	1
Bronchitis, Broncho-pneumonia and Lobar Pneumonia	8	Cystitis	1
Emphysema	1	Arthritis	2
Hæmothorax	1		18
Diarrhœa	1		

Taking the average number of prisoners in Mwanza gaol, 400 cubic feet of space and 32 square feet of floor space are available for each prisoner during sleep. The prison was visited by the Senior Sanitation Officer in December, 1922, and reported to be in an excellent sanitary condition, but it was noted that the ventilation of the cells was unsatisfactory. In his Annual Report for 1922 the Medical Officer, Mwanza, says: "A considerable improvement has been effected this year in the ventilation of the cells. It will be interesting to see if this has any effect on the incidence and severity of pulmonary complaints in the rainy season."

Six deaths occurred in Tukuyu gaol; average number of prisoners was 114. These deaths were all due to pneumonia.

In this gaol 302·5 cubic feet of space and 28·3 square feet of floor space were available for each prisoner, taking the average strength, during sleep.

The remaining deaths were recorded from:—

Dar-es-Salaam	3,	daily average	number	in prison,	175
Lindi	2	,,	,,	,,	47
Utete	1	,,	,,	,,	20
Dodoma	3	,,	,,	,,	99
Tabora	3	,,	,,	,,	142
Namanyere	3	,,	,,	,,	26·45
Tanga	2	,,	,,	,,	93
Bagamoyo	2	,,	,,	,,	25
Morogoro	3	,,	,,	,,	181
Lushoto	2	,,	,,	,,	20
Bukoba	3	,,	,,	,,	not known

There was a small outbreak of scurvy in Tabora gaol—6 cases in all. They made excellent recoveries as soon as the nature of the disease was recognised and suitable treatment adopted. The Senior Medical Officer, Tabora, reports that all the cases were natives who, for various reasons, were not permitted to work outside the gaol, and he believes that they were for this reason, deprived of the opportunity of gathering the fresh wild fruits and vegetables which enabled their fellow prisoners to escape the disease. It is not improbable that minor degrees of vitamine deficiency are responsible for a considerable amount of debility of unrecognised causation amongst prisoners undergoing long sentences. The normal basis of a native dietary is, as the Director of Laboratory has pointed out, poor in antiscorbutic value; when subjected to prolonged cooking, as not uncommonly happens, what little value it possesses in this respect is destroyed. It is not always possible to purchase the alternatives for which the diet scale provides. When living his own village life the native has many small additions of vegetable, fruit, flesh, honey, etc., etc., to his meal, porridge or rice. It is evident that a sharp look out must be kept on prisoners serving sentences of more than three months for the earliest signs of vitamine deficiency and that every opportunity of adding fresh food to the diet must be taken.

Criminal lepers have caused some difficulty in the past, and it is proposed to establish a small separate prison for this class at Morogoro.

DIET SCALE, NATIVE PRISONERS.

(A.)			(B.)	
Maize or maize meal or its equivalents	1½ lbs.	Monday Wednesday Friday and Saturday	Maize or its equivalents	1½ lbs.
Beans	½ lb.		Beans	½ lb.
Salt	¼ oz.		Salt	¼ oz.
			Ghee	1 oz.
Potatoes or equivalents	3 lbs.	Tuesday Thursday Sunday	Potatoes or equivalents	4 lbs.
Beans	¾ lb.		Beans	¾ lb.
Salt	½ oz.		Salt	½ oz.
			Ghee	2 oz.

(A.)—Diet to be issued to Short Term male prisoners, women and juveniles.

(B.)—Diet to be issued to Long Term male prisoners, male Remands and Civil prisoners who are rationed by the Prison Authorities.

Penal diet 1 lb. maize and 1 gallon of water.

Equivalents of maize :—Mtama, wimbi, and native rice, equal weights. Halwa rice 16 ozs. = 1 lb. maize.

Equivalents of potatoes :—Sweet potatoes, muhogo, plantains : in the proportion of 4 lbs. of any of the above vegetables to 3 lbs. of potatoes.

In lieu of ghee on Tuesdays, Thursdays and Sundays, a ration of 4 oz. fresh meat (beef, mutton, camel, or goat) should at least one week in each month be issued to long term prisoners as a change, and in prisons situated on or near the coast a fish ration may be issued on one day in the week in lieu of ghee or meat.

(*f*) REPORT ON THE HEALTH OF THE KING'S AFRICAN RIFLES.

6TH K.A.R.

THE 6TH K.A.R.—The headquarters of this Battalion are at Dar-es-Salaam, where two companies and the depôt are stationed. Companies are stationed at Arusha and Iringa and half a company at Zanzibar. In the middle of January the garrison (one company), which had hitherto been stationed at Lindi, was withdrawn.

EUROPEAN OFFICERS AND N.C.O's.

Total number of Officers and N.C.O's. of the Battalion	35
Average number of Officers and N.C.O's. of the Battalion	30·3
Total number on sick list	30
Total number of days on sick list	358
Average daily number on the sick list	·98
Per cent. of sick to average number resident of the Battalion	3·23
Average number of days on sick list for each patient	11·9
Average sick time to each resident	11·8
Total number invalided	5·71
Per cent. of invalidings to total residents	5·71
Total deaths	—

Of the 358 days off duty on account of sickness:—

75 were on account of malaria.
116 were on account of blackwater fever.

191

167 were on account of other diseases.

Of the 30 occasions on which European Officers and N.C.O's. were placed on the sick list:—

11 were on account of malaria.
4 were on account of blackwater fever (in three patients).

15

1 was on account of amœbic dysentery.
14 were on account of other diseases.

15

The two invalidings were on account of blackwater fever; one was permanently invalided out of the country.

DAR-ES-SALAAM.

(1) British Officers and N.C.O's.

Except for malaria and blackwater fever, which accounted for 80 per cent. of the sick, the general health has been good. The following table taken from the report of the Medical Officer in charge, Sewa Hadji Hospital, shows the figures for all diseases, including malaria and for malaria alone. Included in the latter are two cases of blackwater fever:—

	All Diseases.	Malaria.
Total Officers resident	17	17
Average Officers resident	15	15
Total on sick list	10	8
Total days on sick list	110	101
Per cent. of sick to average number resident	2·0	1·9
Average number of days on sick list for each Officer	7·4 days	6·74 days
Total number invalided	2	2
Per cent. of invalided to residents ...	11·8	11·8
Total deaths	Nil	Nil
Cases contracted away from residence ...	Nil	Nil

(2) Native Ranks.

Average strength of the Dar-es-Salaam garrison ...	499
Average daily number on sick list	8
Per cent. of sick to average strength	1·6
Total number invalided	7
Per cent. of invalidings to average strength	1·4
Total deaths	5
Per cent. of deaths to average strength	1

The invalidings were due to:—

Neuritis	1
Fracture leg	1
Keratitis	1
V.D.H.	1
Beri-Beri	1
Spastic paraplegia	1
Chronic Gonorrhœa	1

The five deaths were all due to beri-beri.

Malaria accounted for 38 per cent., venereal disease 6·9 per cent, and ulcers 6·9 per cent. of the diseases. The venereal cases were mostly chronic gonorrhœa and its sequence. There was only a few cases of syphilis. An outbreak of beri-beri occurred during May, June and July. There were 33 cases, of which 5 died. The sick rate was highest in March and lowest in September.

The predominance of malaria amongst the diseases of both officers and men of the 6th K.A.R. is brought out by the following figures from the report of the Medical Officer in charge, Sewa Hadji, Hospital :—

The percentage of malaria cases among all diseases treated was	22·8
The percentage of malaria cases among non-officials only was	22·8
The percentage of malaria cases among officials (exclusive of K.A.R. and police) was	12·8
The percentage of malaria cases among K.A.R. was ...	38·8

The apparently greater incidence of malaria amongst the K.A.R. is accounted for by the Medical Officer in charge thus :—

(1) Discipline. The soldier must either report sick or work.

(2) The unhealthy surroundings. The position of the camp in a cocoanut shamba close to mosquito breeding creeks.

A Native Dispenser has been stationed at the K.A.R. camp, Dar-es-Salaam, since 1st July, 1922, to attend the minor ailments, thus obviating the necessity of a three-quarters of a mile walk each way to the Sewa Hospital and back.

ARUSHA—NATIVE RANKS.

The average strength of the native ranks of the garrison	182
The average daily number on the sick list	6·3
The percentage of sick to average strength	3·35
Total number invalided	2
Per cent. of invalidings to average strength	1·1
Total deaths	1
Per cent. of death to average strength	0·55

The invalidings were due to :—

(1) Chronic malaria and anæmia.

(2) Delusional insanity.

The death was due to influenza and broncho-pneumonia.

The principal diseases treated were :—

Malaria	14
Influenza	14
Conjunctivitis	4
Chronic Ulcer	4
Pleurisy	1
Syphilis	6
Soft Chancre	3
Epididymitis	2
Rheumatism	5
Chicken-pox	24
Bronchitis	12
Yaws	2
Dysentery (Amœbic)	3
Ankylostomiasis	3
Gonorrhœa	9
Orchitis	5
Lobar Pneumonia	1
Local Injuries (mostly minor ones)	31

The sick rate was highest in February and March and lowest in August and September.

IRINGA—NATIVE RANKS.

Average strength of the native ranks of the garrison	173
Average daily number on the sick list	4·92
Per cent. of sick to average strength	2·84
Total number invalided	2
Per cent. of invalidings to average strength	1·16
Total deaths	1
Per cent. of deaths to average strength	0·6

The invalidings were due to (1) chronic malaria; (2) chronic bronchitis and anæmia.

The death was due to pneumonia.

The principal diseases treated were :—

Malaria	33
Yaws	2
Syphilis	9
Gonorrhœa	30

Bronchitis	74
Influenza	49
Diarrhœa	18
Arthritis	21

For much of the information contained in this report I am indebted to the Officer Commanding 6th K.A.R.

Zanzibar—Native Ranks.

Average daily number on sick list	8
Total days on sick list (including malaria, etc.) ...	866
Total days on sick list for malaria	78
Total days on sick list for blackwater	3

(These were transferred to Native Hospital as soon as diagnosed.)

Number died (two of blackwater) in Native Hospital, 3.

Number invalided, etc., not available.

For the information concerning the garrison, for half a company at Zanzibar I am indebted to the Principal Medical Officer, Zanzibar.

2nd KING'S AFRICAN RIFLES.

The 2nd K.A.R. has its headquarters at Tabora; detachments are stationed at Mwanza and Kigoma, and an escort of one Officer and 40 native ranks accompanied the Anglo-Belgian Boundary Commission from Kigoma in September, 1922.

European Officers and Non-Commissioned Officers.

Total number of Officers and N.C.O.'s	32
Average number of Officers and N.C.O.'s	23
Total number on sick list	28
Total number of days on sick list	144
Average daily number on sick list	0·4
Per cent. of sick to average number resident	1·74
Average number of days on the sick list of each patient	5·14
Average sick time to each resident	6·26
Total number invalided	*Nil*
Total deaths	*Nil*

Of the 144 days off duty on account of sickness,

65 were on account of malaria,
46 were on account of blackwater fever.

111

33 were on account of other diseases.

Of the 28 occasions on which European Officers and N.C.O.'s were placed on the sick list,

18 were on account of malaria,
2 were on account of blackwater fever.

20

3 were on account of tick fever,
5 were on account of other diseases.

8

Tabora—Native Ranks.

The average strength (native ranks) of the garrison was	264·5
The number of admissions to hospital was	317
Total number of deaths was	2

The admissions to hospital were on account of :—

Enteric fever	2
Pneumonia	12
Malaria	159
Dysentery	1
Tick fever	5
Small-pox	1
Influenza	4
Measles	2
Yaws	1
Gonorrhœa	10
Syphilis	15
Other diseases	105

The deaths were due to pneumonia.

MWANZA.

The average strength of the garrison (native ranks) was 173·7. There were no deaths. No further information is available.

KIGOMA.

The average strength of the garrison (native ranks) was 174·2. There were 46 admissions to hospital, including:—

Malaria	10
Syphilis	3
Gonorrhœa	1

and 482 cases attended as out-patients; amongst these were 84 cases of malaria.

For information regarding the strength of the garrison I am indebted to the Officer Commanding 2nd K.A.R.

THE 2/1 KING'S AFRICAN RIFLES.

The headquarters of the 2/1 K.A.R. are at Massoko, about 12 miles from Tukuyu; a garrison of one company is stationed at Songea and half a company at Mahenge.

BRITISH OFFICERS AND NON-COMMISSIONED OFFICERS.

Total number of Officers and N.C.O.'s	27
Average number of Officers and N.C.O.'s	21
Total number of Officers and N.C.O.'s on the sick list	17
Total number of days on the sick list	131
Average daily number on the sick list	0·36
Per cent. to average number resident	1·71
Average number of days on sick list for each patient	7·70
Average sick time to each resident	6·24
Total number invalided	*Nil**
Total deaths	*Nil*

One officer granted one week's recuperative leave.

Of the 131 days on the sick list:—

90 were on account of malaria,
14 were on account of ankylostomiasis,
27 were on account of other diseases.

---

* One officer granted two months' sick leave in Nyasaland.

Of the 17 attacks of illness :—

10 were malaria,
2 were ankylostomiasis,
5 were other diseases.

NATIVE RANKS.

(1) MASSOKO.

Average strength	170
Average daily number on the sick list	5
Per cent. of sick to average number resident	2·29
Deaths	*Nil.*

(2) SONGEA.

Average strength	224
Average daily number on the sick list	4
Per cent. of sick to average number resident	1·79
Death	1

(3) MAHENGE.

Average strength	97
Average daily number on the sick list	3
Per cent. of sick to average number resident	3·09
Death	1

The principal diseases treated at Mahenge were :—

Malaria, 17 cases,
Syphilis, 12 cases,
Gonorrhœa, 5 cases.

The death was reported to be due to endocarditis of the aortic and mitral valves.

For statistics regarding the strength of garrisons I am indebted to the Officer Commanding 2/1 K.A.R.

TABLE "F."

SURGICAL OPERATIONS PERFORMED IN THE GOVERNMENT HOSPITALS OF THE TERRITORY DURING 1922.

Nature of Operation.	No. of Cases.	Result.					Remarks.
		Successful.	Improved.	Unsuccessful.	Died.	Remaining in Hospital.	
Abscess, incision	60	58	—	—	—	2	1 of Bartholins Gland, 1 Ischiorectal, 1 of Breast, 2 Lumbar, 2 Perinephritic, 56 various.
Sinuses and Chronic Ulcers, curetting ...	52	49	2	—	—	1	42 Chronic Tropical Ulcers, 10 Sinuses.
Wounds: Exploration or excision of, and suture	32	22	9	—	—	1	2 Gunshot wounds, 1 stab, 2 injuries by Elephants, 1 of Trachea.
Severed Tendons, suture of...	1	1	—	—	—	—	—
Enlarged lymphatic glands, excision of ...	4	4	—	—	—	—	3 Suppurating.
Removal of foreign body	8	7	—	—	—	1	4 Gunshot wounds.
Tumours and Cysts, excision of	60	53	—	1	3	3	10 Lipomata, 6 Fibromata, 1 Mixed Tumour of Parotid Gland, 4 Sarcomata (one died, one inoperable) 1 Epithelioma of Tongue, 1 Thyro-glossal Cyst, 1 Cyst of Testicle, 28 various.
Ligature of Artery	1	1	—	—	—	—	Posterior Tibial artery.
Sequestrectomy	26	24	—	—	2	—	1 following injury by lion.
Osteotomy	3	3	—	—	—	—	—
Fractures and dislocations, reduction and setting	24	23	—	—	1	—	9 Compound Fractures.
Suture of Cords of Brachial Nerve Plexus	1	—	—	1	—	—	Old gunshot wound.
Excision Tonsils and curettage adenoids ...	2	2	—	—	—	—	—
For Tubercular glands in neck	4	3	1	—	—	—	—
Thyroidectomy	1	1	—	—	—	—	For Adenoma
Enucleation of Eyeball	3	2	1	—	—	—	1 for Sarcoma, 2 for laceration of globe.
Cataract, extraction	9	8	1	—	—	—	—
For Empyema of frontal sinus	1	—	—	1	—	—	Drained.
,, ,, of pleural cavity	2	1	—	—	1	—	Resection of rib in one case.
For Hernia: Radical cure	91	86	—	1	4	—	5 Strangulated (4 deaths)
Carried forward	385	348	14	4	11	8	

TABLE " F "—*continued.*

SURGICAL OPERATIONS PERFORMED IN THE GOVERNMENT HOSPITALS OF THE TERRITORY DURING 1922—*continued.*

Nature of Operation.	No. of Cases.	Result.					Remarks.
		Successful.	Improved.	Unsuccessful.	Died.	Remaining in Hospital.	
Brought forward	385	348	14	4	11	8	
Exploratory Laparotomy	5	1	1	1	2	—	1 Sarcoma of Omentum (inoperable) died, 1 Carcinoma of stomach (inoperable), 1 for Tabes Mesenterica, 2 for replacement of intestines after laceration of abdominal wall (1 died).
Laparotomy. Suture of Intestine	2	—	—	—	2	—	1 Bayonet wound.
,, Appendix abscess	1	1	—	—	—	—	—
For Hœmorrhoids	5	5	—	—	—	—	4 Excision, 1 Ligature.
For Replacement Prolapsed Rectum ...	1	1	—	—	—	—	—
For Fistula in Ano	2	2	—	—	—	—	—
Suprapubic Lithotomy	2	2	—	—	—	—	For Calculus.
Dilatation Urethral Stricture	16	14	2	—	—	—	—
Urethral Fistuloe. Excision and closure...	1	1	—	—	—	—	—
External Urethrotomy	9	6	3	—	—	—	—
For Ruptured Urethra	2	—	—	—	2	—	Fractures of Pelvis.
Varicocele : Open operation for	1	1	—	—	—	—	—
Radical cure of Hæmatocele	13	12	—	—	1	—	Death from Tetanus.
,, ,, ,, Hydrocele	125	124	—	—	—	1	—
Castration	2	2	—	—	—	—	—
Salpingectomy (double)	1	—	—	—	1	—	Died General Periotonitis fourth day.
Evacuation of contents of Gravid Uterus...	4	4	—	—	—	—	—
Curetting Uterus	6	4	—	—	2	—	2 deaths in Puerperal septiccemia cases.
Perinœorrhapy	5	4	—	1	—	—	—
Hysterectomy	2	2	—	—	—	—	For Fibroids.
For Obstructed Labour	5	1	—	—	4	—	1 Cœsarean Section (septic) died, 1 Incision of Vulva (Nubian woman) and High Forceps, 3 Craniotomy. All died.
Carried forward	595	535	20	6	25	9	

TABLE "F"—*continued.*

SURGICAL OPERATIONS PERFORMED IN THE GOVERNMENT HOSPITALS OF THE TERRITORY DURING 1922—*continued.*

Nature of Operation.	No. of Cases.	Result.					Remarks.
		Successful.	Improved.	Unsuccessful.	Died.	Remaining in Hospital.	
Brought forward	595	535	20	6	25	9	
For Delayed Labour...	6	6	—	—	—	—	—
Elephantiasis of Scrotum, excision of ...	72	67	—	—	5	—	—
,, ,, Penis, excision of tissue ...	3	3	—	—	—	—	—
,, ,, Labium, excision	2	2	—	—	—	—	—
,, ,, Leg, removal of tissue ...	1	—	1	—	—	—	—
Amputations, fingers and toes	16	16	—	—	—	—	1 for Sarcoma of Thumb.
,, through Tarsus	1	1	—	—	—	—	—
,, ,, lower third of leg ...	1	1	—	—	—	—	For septic compound fracture.
,, ,, middle ,, ,, ,, ...	1	1	—	—	—	—	For old compound fracture.
,, ,, upper ,, ,, ,, ...	2	1	—	—	—	1	1 for Gangrene of foot.
,, ,, kneejoint (S. Smith)	1	1	—	—	—	—	For Mycetoma.
,, ,, femur	8	7	—	—	1	—	2 for old compound fractures (one died) 1 for lacerated wound by lion.
,, of hand	1	1	—	—	—	—	—
,, through forearm	3	3	—	—	—	—	—
,, ,, humerus	4	1	—	—	1	2	1 for Gangrene (died), 3 for compound fractures.
,, no details given	1	1	—	—	—	—	1 for "Cancer"
Plastic operations	5	4	1	—	—	—	1 Malgaignes for Harelip.
Various minor operations	133	115	2	2	5	9	Including circumcisions 74 and skin graftings 24. Deaths: 2 after lumbar puncture in C.S. Meningitis, 1 after paracentesis of abdomen in Ankylostomiasis, 1 after paracentesis of pleura in Hamothorax, 1 after removal of retained placentoe (2) septic.
TOTAL	856	766	24	8	37	21	

TABLE G.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1922.

Diseases.	In-Patients.					Out-Patients.			Total cases In-and Out-Patients.
	Remaining in Hospital at the end of 1921.	Yearly Total		Total cases treated.	Remaining in Hospital at the end of 1922.	Males.	Females.	Total.	
		Admissions.	Deaths.						
Infective diseases—									
Beri Beri	—	34	5	34	1	—	—	—	34
Cerebro Spinal Meningitis	—	11	9	11	—	1	—	1	12
Chicken Pox	1	110	—	111	4	5	3	8	119
Diphtheria	—	1	—	1	—	1	—	1	2
Dysentery	3	167	18	170	2	167	32	199	369
Enteric Fever	1	17	2	18	—	—	—	—	18
Erysipelas	1	5	—	6	—	6	—	6	12
Gonorrhœa	10	300	—	310	16	792	96	888	1,198
Influenza	18	489	15	507	—	1,349	286	1,635	2,142
Leprosy (*a*) Nodular	3	5	1	8	2	3	5	8	16
(*b*) Anæsthetic	1	14	—	15	—	13	—	13	28
Malaria	46	2,763	16	2,809	29	11,358	2,218	13,576	16,385
(*a*) Cerebral	—	8	4	8	—	—	—	—	8
(*b*) Chronic	—	53	4	53	1	42	4	46	99
(*c*) Blackwater	2	42	4	44	1	2	1	3	47
Measles	17	27	—	44	1	11	7	18	62
Malta Fever	—	1	—	1	1	—	—	—	1
Plague	—	8	7	8	—	—	—	—	8
Pneumonia	5	279	81	284	4	73	26	99	383
Relapsing Fever	—	40	—	40	—	3	1	4	44
Rheumatic Fever	1	19	2	20	—	35	4	39	59
Septicæmia	1	10	1	11	2	—	—	—	11
Trypanosomiasis (Sleeping Sickness)	—	64	42	64	22	—	—	—	64
Small-pox	7	62	14	69	—	—	—	—	69
Syphilis—									
(*a*) Primary	19	279	4	298	17	207	64	271	569
(*b*) Secondary	51	401	1	452	33	807	222	1,029	1,481
(*c*) Tertiary	—	20	—	20	2	1	—	1	21
(*d*) Inherited	6	25	—	31	—	34	9	43	74
Tetanus	—	9	4	9	—	—	—	—	9
Tuberculosis	9	95	23	104	5	92	10	102	206
Whooping Cough	—	11	—	11	—	6	5	11	22
Yaws	52	1,012	6	1,064	9	1,517	542	2,059	3,123
Vaccinia	—	3	—	3	—	8	1	9	12
Gangosa	—	1	—	1	—	—	—	—	1
Ulcerating granuloma	—	1	—	1	1	—	—	—	1
Mumps	—	22	—	22	—	27	5	32	54
Typhus Fever	—	1	—	1	—	—	—	—	1
Rubella	—	1	—	1	—	—	—	—	1
Actinomycosis	—	1	—	1	—	—	—	—	1
P.U.O.	—	23	—	23	—	35	5	40	63
Carried forward	254	6,434	263	6,688	153	16,595	3,546	20,141	26,829

TABLE G—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1922—*continued.*

Diseases.	In-Patients.					Out-Patients.			Total cases In-and Out-Patients.
	Remaining in Hospital at the end of 1921.	Yearly Total		Total cases treated.	Remaining in Hospital at the end of 1922.	Males.	Females.	Total.	
		Admissions.	Deaths.						
Brought forward	254	6,434	263	6,688	153	16,595	3,546	20,141	26,829
Intoxications—									
Alcoholism ...	—	1	—	1	—	2	—	2	3
Heat Stroke ...	—	1	—	1	—	—	—	—	1
General diseases—									
Anæmia	3	101	8	104	1	432	140	572	676
Anæmia Pernicious	—	1	—	1	1	—	—	—	1
Diabetes	—	4	1	4	1	1	3	4	8
Gout	—	2	—	2	—	3	—	3	5
Rickets	1	44	5	45	2	6	5	11	56
Scurvy	—	6	—	6	—	13	12	25	31
Pellagra	—	1	1	1	—	—	—	—	1
Purpura	—	1	—	1	—	—	—	—	1
Debility	—	5	1	5	—	—	—	—	5
Inanition	—	1	—	1	—	17	3	20	21
Other G. D. ...	1	44	5	45	2	129	21	150	195
Local diseases—									
Diseases of the Nervous System—									
Neuritis	—	23	—	23	—	244	34	278	301
Meningitis ...	—	1	1	1	—	1	—	1	2
Myelitis	—	—	—	—	—	4	—	4	4
Congestion of Brain	—	—	—	—	—	1	—	1	1
Apoplexy... ...	—	10	6	10	2	1	1	2	12
Paralysis	3	17	3	20	—	30	2	32	52
Epilepsy	1	31	1	32	—	37	27	64	96
Neuralgia... ...	—	78	—	78	1	1,109	214	1,323	1,401
Hysteria	—	4	—	4	—	4	6	10	14
Neurasthenia ...	1	8	—	9	—	7	2	9	18
Paralysis Agitans	—	1	—	1	—	—	—	—	1
Bulbar Paralysis...	—	1	1	1	—	—	—	—	1
Locomotor Ataxia	—	1	—	1	—	—	—	—	1
Others	—	15	5	15	—	74	18	92	107
Mental diseases—									
Mania	1	5	—	6	—	4	4	8	14
Melancholia ...	—	4	1	4	1	2	—	2	6
Dementia... ...	—	1	1	1	—	—	—	—	1
Delusional Insanity	2	3	—	5	—	8	1	9	14
Others	—	4	—	4	—	—	—	—	4
Diseases of the Eye—									
Conjunctivitis ...	3	204	—	207	—	2,387	762	3,149	3,356
Keratitis	1	8	—	9	—	24	2	26	35
Ulceration of Cornea	2	9	—	11	—	31	6	37	48
Iritis	1	11	—	12	—	34	3	37	49
Optic Neuritis ...	—	—	—	—	—	1	—	1	1
Cataract	—	12	—	12	—	30	6	36	48
Panophthalmitis...	—	1	—	1	—	—	—	—	1
Trachoma ...	—	1	—	1	—	1	—	1	2
Carried forward	274	7,109	303	7,383	164	21,032	4,818	26,090	33,423

TABLE G—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1922—*continued.*

Diseases.	In-Patients.					Out-Patients.			Total cases In-and Out-Patients.
	Remaining in Hospital at the end of 1921.	Yearly Total		Total cases treated.	Remaining in Hospital at the end of 1922.	Males.	Females.	Total.	
		Admissions.	Deaths						
Brought forward	274	7,209	303	7,373	164	21,032	4,818	26,090	33,423
Diseases of the Eye— continued.									
Glaucoma ...	1	—	—	1	—	—	—	—	1
Other eye diseases	3	49	—	52	1	340	50	390	442
Diseases of the Ear—									
Inflammation ...	1	14	—	15	—	744	204	948	963
Others	—	7	—	7	—	448	175	623	630
Diseases of the Nose—									
Coryza	—	13	—	13	—	27	1	28	41
Epistaxis	—	7	—	7	—	3	1	4	11
Ozoena	—	—	—	—	—	3	—	3	3
Others	—	12	—	12	—	97	17	114	126
Diseases, Circulatory System—									
Pericarditis ...	—	3	1	3	—	1	—	1	4
Endocarditis ...	—	1	1	1	—	8	—	8	9
Valvular Mitral ...	1	15	2	16	—	14	3	17	33
,, Aortic ...	—	2	2	2	—	3	1	4	6
,, Tricuspid	—	3	—	3	—	—	—	—	3
Arterio-sclerosis ...	—	1	1	1	—	6	3	9	10
Aneurism	—	3	2	3	—	3	—	3	6
Others	—	7	5	7	—	35	23	58	65
Diseases of Respiratory System—									
Laryngitis ...	—	11	—	11	1	125	16	141	152
Bronchitis ...	6	426	2	432	12	9,284	1,881	11,165	11,597
Broncho Pneumonia	—	32	10	32	1	26	11	37	69
Emphysema ...	—	4	—	4	—	1	—	1	5
Pleurisy	1	44	4	45	1	49	12	61	106
Empyema ...	—	4	—	4	—	2	—	2	6
Asthma	—	5	—	5	—	113	87	200	205
Hæmoptysis ...	—	2	1	2	—	4	—	4	6
Others	—	29	6	29	1	425	123	548	577
Diseases of the Digestive System—									
Stomatitis ...	2	15	—	17	—	380	127	507	524
Caries of Teeth ...	—	23	—	23	—	1,958	724	2,682	2,705
Sore Throat ...	—	23	—	23	—	384	96	480	503
Inflammation of Tonsils	1	28	—	29	—	246	108	354	383
Gastritis	1	22	—	23	—	223	72	295	318
Ulceration of Stomach ...	—	3	1	3	1	1	1	2	5
Hæmatemesis ...	—	—	—	—	—	3	—	3	3
Dilatation of Stomach	—	—	—	—	—	3	—	3	3
Dyspepsia ...	—	20	—	20	—	412	88	500	520
Enteritis	—	9	—	9	—	3	—	3	12
Appendicitis ...	—	6	—	6	—	2	3	5	11
Colitis	1	40	—	41	—	99	14	113	154
Carried forward	292	8,092	341	8,274	182	36,707	8,659	45,366	53,640

TABLE G—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1922—*continued.*

Diseases.	In-Patients.					Out-Patients.			Total cases In-and Out-Patients.
	Remaining in Hospital at the end of 1921.	Yearly Total		Total cases treated.	Remaining in Hospital at the end of 1922.	Males.	Females.	Total.	
		Admissions.	Deaths						
Brought forward	292	8,092	341	8,274	182	36,707	8,659	45,366	53,640
Diseases of the Digestive System—									
Ulceration of Intestines ...	—	1	—	1	—	—	—	—	1
Hernia	8	117	7	125	10	35	1	36	161
Diarrhœa... ...	2	238	6	240	3	2,140	549	2,689	2,929
Constipation ...	1	51	—	52	—	4,266	946	5,212	5,264
Colic	—	97	—	97	—	1,158	239	1,397	1,494
Hæmorrhoids ...	1	22	—	23	—	48	7	55	78
Pancreatitis ...	—	2	1	2	—	—	—	—	2
Hepatitis Acute ...	—	21	—	21	—	39	10	49	70
,, Abscess	—	4	1	4	—	2	—	2	6
Cirrhosis	—	7	4	7	—	6	5	11	18
Jaundice	—	4	—	4	—	23	4	27	31
Peritonitis ...	—	1	1	1	—	3	1	4	5
Ascites	2	41	2	43	—	9	4	13	56
Canerum Oris ...	1	1	2	2	—	—	—	—	2
Parotitis	—	4	—	4	—	1	—	1	5
Fistula-in-ano ...	—	2	—	2	—	—	—	—	2
Gall Stones ...	—	1	—	1	—	—	—	—	1
Others	—	38	1	38	—	141	18	159	197
Diseases, Lymphatic System—									
Splenitis	—	6	—	6	5	67	18	85	91
Inflammation of Lymphatic Gland	—	77	—	77	—	286	57	343	420
Suppuration of Lymphatic Gland	—	33	—	33	1	33	3	36	69
Lymphangitis ...	—	8	—	8	1	13	8	21	29
Elephantiasis ...	16	146	5	162	19	86	11	97	259
Others	—	6	—	6	4	8	—	8	14
Diseases of the Urinary System—									
Acute Nephritis ...	—	15	2	15	—	15	1	16	31
Brights disease ...	—	11	2	11	—	18	4	22	33
Pyelitis	—	4	1	4	—	—	2	2	6
Renal Colic ...	—	3	—	3	—	3	—	3	6
Cystitis	—	16	4	16	1	38	7	45	61
Vesical Calculus ...	—	2	—	2	1	4	1	5	7
Suppression ...	—	1	—	1	—	3	—	3	4
Hæmaturia ...	—	14	—	14	—	32	2	34	48
Chyluria	—	—	—	—	—	1	—	1	1
Fistula, urethral	—	1	—	1	—	—	—	—	1
Others	—	11	2	11	—	20	2	22	33
Diseases of Generative System—									
Male Organs.									
Urethritis... ...	—	1	—	1	—	35	—	35	36
Carried forward	323	9,099	382	9,312	227	45,240	10,559	55,799	65,111

TABLE G—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1922—*continued.*

Diseases.	In-Patients.					Out-Patients.			Total cases In and Out-Patients.
	Remaining in Hospital at the end of 1921.	Yearly Total		Total cases treated.	Remaining in Hospital at the end of 1922.	Males.	Females.	Total.	
		Admissions.	Deaths						
Brought forward	323	9,099	382	9,312	227	45,240	10,559	55,799	65,111
Diseases of Generative System—continued									
Male Organs—contd.									
Gleet	—	3	—	3	—	29	—	29	32
Stricture	7	38	1	45	—	19	—	19	64
Prostatitis ...	—	—	—	—	—	1	—	1	1
Soft Chancre ...	3	66	—	69	—	63	—	63	132
Condyloma ...	—	3	—	3	—	22	—	22	25
Inflammation of Scrotum	—	4	—	4	—	—	—	—	4
Hydrocele ...	9	156	1	165	8	57	—	57	222
Orchitis	3	72	—	75	1	236	—	236	311
Epididymitis ...	1	23	—	24	1	26	—	26	50
Varicocele ...	—	1	—	1	—	—	—	—	1
Others	1	9	1	10	1	50	—	50	60
Female Organs.									
Ovaritis	—	2	—	2	—	—	4	4	6
Ovarian Cyst ...	—	—	—	—	—	—	1	1	1
Endometritis ...	—	4	1	4	—	—	9	9	13
Displacement of Uterus	—	6	—	6	—	—	6	6	12
Vaginitis	—	1	—	1	—	—	13	13	14
Amenorrhœa ...	—	—	—	—	—	—	34	34	34
Dysmenorrhœa ...	—	1	—	1	—	—	30	30	31
Menorrhagia ...	—	4	—	4	—	—	17	17	21
Leucorrhœa ...	—	2	—	2	—	—	9	9	11
Abortion	—	19	1	19	—	—	3	3	22
Delayed Labour ...	1	17	3	18	—	—	5	5	23
Postpartum Hæmorrhage ...	—	1	—	1	—	—	—	—	1
Retained Placenta	—	7	4	7	—	—	3	3	10
Premature Birth...	—	6	1	6	—	—	2	2	8
Puerperal Septicæmia ...	—	9	3	9	—	—	2	2	11
Mastitis	—	3	—	3	—	—	10	10	13
Abscess of Breast	—	5	—	5	—	—	43	43	48
Parturition ...	1	47	—	48	—	—	—	—	48
Others	3	43	3	46	—	—	13	13	59
Diseases of Organs of Locomotion—									
Osteitis	4	17	—	21	3	43	14	57	78
Arthritis	3	89	2	92	1	1,836	215	2,051	2,143
Spondylitis ...	—	2	—	2	—	2	—	2	4
Bursitis	—	5	—	5	—	6	2	8	13
Myalgia	—	2	—	2	—	507	82	589	591
Lumbago	—	5	—	5	—	58	12	70	75
Teno-synovitis ...	—	2	—	2	—	1	—	1	3
Synovitis	—	30	—	30	—	37	—	37	67
Osteomyelitis ...	—	1	—	1	—	—	—	—	1
Others	2	97	1	99	4	835	19	854	953
Carried forward	361	9,801	404	10,152	246	49,068	11,107	60,175	70,327

TABLE G—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1922—*continued.*

Diseases.	In-Patients.					Out-Patients.			Total cases In-and Out-Patients.
	Remaining in Hospital at the end of 1921.	Yearly Total		Total cases treated.	Remaining in Hospital at the end of 1922.	Males.	Females.	Total.	
		Admissions.	Deaths						
Brought forward	361	9,801	404	10,152	246	49,068	11,107	60,175	70,327
Diseases of Connective Tissue—									
Cellulitis	4	166	1	170	6	764	129	893	1,063
Abscess	10	250	1	260	4	970	204	1,174	1,434
Sinus	—	2	—	2	—	1	1	2	4
Fistula	—	—	—	—	—	1	—	1	1
Others	7	187	3	194	37	684	106	790	984
Diseases of Skin—									
Urticaria	—	3	—	3	—	19	1	20	23
Eczema	—	45	—	45	—	440	74	514	559
Boil	—	44	—	44	—	690	148	838	882
Carbuncle ...	—	9	—	9	—	13	4	17	26
Herpes	—	4	—	4	—	40	5	45	49
Psoriasis	—	3	—	3	—	30	2	32	35
Tinea	—	7	—	7	—	89	11	100	107
Scabies	6	129	—	135	—	4,841	887	5,728	5,863
Acne	—	1	—	1	—	3	—	3	4
Prickly Heat ...	—	—	—	—	—	18	2	20	20
Blastomycosis ...	—	1	—	1	—	—	—	—	1
Pemphigus ...	—	1	—	1	—	—	—	—	1
Mycetoma ...	—	2	—	2	—	2	—	2	4
Ulcers	65	612	5	677	68	5,822	1,292	7,114	7,791
Others	7	167	—	174	30	613	48	661	835
Injuries—									
General	3	63	9	66	2	2,211	156	2,367	2,433
Local	39	1,237	18	1,276	41	1,259	1,801	3,060	4,336
Tumours	7	71	8	78	8	38	12	50	128
Malformations ...	—	4	—	4	—	7	—	7	11
Poisons	—	12	1	12	—	19	2	21	33
Snake bite ...	1	16	—	17	1	16	1	17	34
Arsenic poisoning	—	3	—	3	—	—	—	—	3
Phosphorus ...	—	1	—	1	—	—	—	—	1
Parasites—Animal—									
Leach in Larynx...	—	—	—	—	—	1	—	1	1
Trematoda—Bilharzia	—	28	1	28	1	7	—	7	35
Cestoda—									
Tænia Solium ...	—	33	—	33	—	141	21	162	195
,, Saginata ...	—	13	—	13	—	425	58	483	496
Nematoda—									
Ascaris	—	2	—	2	—	1,697	1,556	3,253	3,255
Filariasis	5	6	—	11	—	2	1	3	14
Ankylostomiasis ...	14	175	43	189	10	1,249	553	1,802	1,991
Oxyuris	—	—	—	—	—	8	—	8	8
Insecta—									
Myiasis	—	—	—	—	—	5	1	6	6
Chiggers	—	9	—	9	—	254	55	309	318
N.Y.D.	—	24	—	24	—	70	4	74	98
GRAND TOTAL...	529	13,121	494	13,650	454	71,517	18,242	89,759	103, 409

SECTION 3.

NEW MEDICAL BUILDINGS ERECTED AND REPAIRS TO EXISTING MEDICAL ESTABLISHMENTS EFFECTED DURING 1922.

MOSHI.

In July a cottage hospital for Europeans was established in the town. The building is a private residence and is rented at Shs. 260/- p.m. It provides two small wards, each containing one bed, and quarters for the nursing sister. Settlers in the district have shown their appreciation by presenting a cot fitted with mattress, bedding, etc., and in other practical ways.

Hitherto the German Land Bank has been used as a native hospital, a purpose for which it was ill adapted. Its sale in September by the Custodian of Enemy Property precipitated a situation of some difficulty which had been foreseen. Fortunately, mainly through the influence of the Senior Commissioner (the Hon. C. Dundas), the native chiefs erected, free of cost, several well constructed temporary wards of native design and materials. The Public Works Department put up an administrative block of three small rooms of semi-permanent type, comprising dispensary, office and operating room; these buildings were nearly completed at the end of the year and will provide accommodation for about 50 in-patients. The Land Bank was rentel from the date of sale at Shs. 200/- p.m.; it was expected to transfer the patients to the new hospital early in the new year.

A new abattoir has been constructed near the stream below the native watering place. It is a well constructed building with cemented floor and arrangements for flushing.

MOROGORO.

Minor repairs were carried out at the hospital by the Public Works Department.

MIKINDANI.

A dispensary, with a Sub-Assistant Surgeon in charge, was opened in a room in the administrative building in June; it was later transferred to two rooms on the ground floor of the Usagara building. There is no hospital.

Quarters for the Sub-Assistant Surgeon were put in hand by the Public Works Department.

LINDI.

Repairs and alterations to the hospital buildings and the erection of a house for the Medical Officer were commenced by the Public Works Department.

DAR-ES-SALAAM.

Sewa Hadji Hospital.—By reorganisation, three rooms, previously used as stores, were made available for in-patients; there are now twenty wards, accommodating 115 beds. Owing to the rapidly increasing number of patients this number has proved insufficient, and it has sometimes been necessary to place convalescents in a marquee.

Two boilers for disinfecting bedding and clothing were erected adjoining the laundry, a building—previously unused—which was taken into use during the year. One ward was repainted and its floor re-cemented; it was furnished with an iron bedstead, etc., and set apart as a labour ward; the adjoining ward was fitted with a cradle, weighing machine, etc., for use as a lying-in ward. The four Asiatic wards have been equipped with curtains, screens, blankets, and linen and crockery.

European Hospital.—An improved water supply has been laid on, Painting and recementing the floors of the whole of the Goanese wing has been completed.

A special flush sink for bed pans was put in.

A new staircase leading to the second storey was erected.

Base Medical Store.—The accommodation has hitherto been insufficient and is arranged inconveniently. Work was commenced which will effect a considerable improvement; the verandah is being enclosed to afford additional space and better supervision over the several store rooms.

Market.—Some repairs were effected at the market, and work was commenced on the conversion of the Exhibition building into a new market. The old market is extremely congested; when the new building is ready it will be a magnificent market and should provide ample accommodation for many years to come.

BAGAMOYO.

Minor repairs were effected at the hospital and market. The fish market was renovated,

MAHENGE.

An abattoir with cemented floor has been constructed and several incinerators erected.

KIGOMA.

The erection of a new native hospital was commenced late in the year. The present hospital consists of a series of dilapidated structures constructed of flattened iron sheets affixed to poles; the latter are riddled by termites; some of them collapsed during the rains and it was found that the materials were too rotten to admit of re-erection.

BUKOBA.

The Germans had a fine permanent hospital at Bukoba. It was taken over as offices on the British occupation, the German offices having been demolished by shell fire, and it has been decided that it is to be retained as administrative offices. A collection of old corrugated iron buildings intended for isolation purposes has hitherto been used as a hospital; it was quite unsuited for the purpose, having no ceilings and no windows—in place of windows the buildings were provided with hinged iron flaps which could be propped up to afford light and air; ventilation was very bad and the heat inside the buildings was oppressive. Under these disadvantageous circumstances some good work was, however, accomplished. It was decided in 1921 to remove these buildings and erect a hospital out of the materials on another site; £200 was provided for the purpose; for 1922/23 a further allocation of £600 was made. I understand that these sums have been expended, but the hospital is not yet fit for occupation, and is unlikely ever to prove entirely satisfactory.

Meanwhile a temporary grass isolation hut has been used as a hospital, small grass shelters being erected to supplement the insufficient accommodation. The Medical Officer, Bukoba, reports that many operation cases have had to be refused admission.

Bukoba is a rich district, inhabited by intelligent natives under powerful and enlightened sultans who are keenly interested in the health of their people, well aware and anxious to avail themselves of the advantages which medical science has to offer them. These people bear close resemblance to the Baganda in their progressive tendencies. It is particularly unfortunate, therefore, that medical work should have to be carried on under such adverse conditions.

NAMANYERE.

The headquarters of Ufipa district were removed to Mamanyere in June, 1922. The Administrative Officer has constructed three wards and a kitchen and latrine at Mamanyere; a dispensary was under construction at the close of the year. The Sub-Assistant Surgeon has been transferred from Kasanga to Namanyere.

KILOSSA.

A substantial two storied building was assigned to the department for hospital purposes and was occupied in June, when repairs and alterations were completed by the Public Works Department. There are eight rooms on the ground floor, of which three are used as wards. The Sub-Assistant Surgeon lives in a part of the upper floor and other rooms on this floor have been used in emergency for sick Europeans and Asiatics.

LUTINDI LUNATIC ASYLUM.

See report of Superintendent, p. 76.

ARUSHA HOSPITAL.

A kitchen for European patients and a European latrine were put in hand by the Public Works Department.

Various minor repairs were executed.

Meat Market: A new fly-proof meat stall was provided.

SONGEA.

The Medical Officer reports that, during 1921-22, the old hospital was re-roofed with grass and timber and extensive repairs to the main building and out-houses were effected. New windows and doors were fitted to each ward. The floor of the operating room was cemented. The store was completely renovated; new latrines and new temporary kitchen were constructed. A new irrigation room with cement floor was built.

A small European hospital of brick with grass roof was completed.

DODOMA.

New hospital buildings were occupied in June. Previously the grass huts of an old Military hospital, about a mile from the railway station, were in use.

The Administrative block consists of a brick building, with iron roof, containing three rooms used as store, operating room and office and dispensary. It is an old dwelling which had fallen into disrepair and was entirely renovated by the Public Works Department before occupation. The wards, of which there are five, are wattle and daub buildings, capable of accommodating a total of 90 beds.

Tabora.

European Hospital.—A new verandah is being built on to the west wing and new bathrooms and W.C.'s constructed. The drainage system is being reconstructed. These works were not completed at the end of the year; they will constitute a very great and much needed improvement.

Native Hospital.—Various minor repairs have been carried out. Perhaps the most important improvement carried out at Tabora was the levelling, stumping and rolling of about 20 acres of bush between the European hospital and K.A.R. lines; this reclaimed area can now be kept in good order by the mowing machine.

For some of the information contained in this section I am indebted to the Director, P.W.D.

SECTION IV.

(a)-REGISTRATION OF MEDICAL AND DENTAL PRACTITIONERS.

On January 1st, 1922, there were on the Register :—

Medical practitioners	31
Dentists	1

During the year 1922 there were entered on the Register :—

Medical practitioners	4
Dentists	*Nil*

And there were removed from the Register on final departure from the Territory the names of :—

Medical practitioners	4
Dentists	*Nil*

On the Register on December 31st, 1922, there were therefore :—

Medical practitioners	31
Dentists	1

Of the 31 medical practitioners 26 are in Government service, two are in the employ of Missionary Societies and three are graduates of the Bombay University who are in private practice. The Government Dentist is the only registered dental practitioner.

Under the Medical Practitioners Proclamation No. 19 of 1920, the Principal Medical Officer has authority to licence "Assistant Surgeons and Hospital Assistants" in the employ of the Government as medical practitioners. Such licences immediately expire on the licensee ceasing to be in the service of the Government. By an amending Ordinance, No. 6 of 1921, the Principal Medical Officer is empowered to licence persons who have retired after having performed meritorious service under the Government as an Assistant Surgeon or Sub-Assistant Surgeon. On December 31st, 1922, there were 20 licentiates in the Territory, all being in Government service.

(*b*)—REGISTRATION OF DRUGGISTS.

The Drugs and Poisons Proclamation, No. 25 of 1920, regulates the sale of drugs and poisons and provides for the registration of druggists. It declares it to be unlawful for an unregistered person to carry on business as a druggist. Drugs and poisons are defined in the Proclamation. There were three names on the Druggists' Register in 1921, and no new names were inscribed during 1922. Of the three licensees, two are in business in Dar-es-Salaam and Tanga; the third is the Government Medical Storekeeper.

(*c*)—LEGISLATION DURING 1922.

Drugs, Customs Duties on.

Government Notice No. 6 of January 11th, 1922, placed "drugs and medicines, imported for *bonâ fide* medicinal purposes and rectified spirit to be used solely in the compounding of drugs and medicines" on the list of articles exempt from Custom duties.

On December 30th, 1922, a new Customs Tariff Ordinance, to come into force on January 1st, 1923, was published in the *Gazette.* It provided for the free importation of drugs, dressings, disinfectants, surgical instruments and appliances, vaccine lymph, sera and radium. A duty of 30 per cent *ad valorem* is levied on medical preparations "when prepared by any secret or occult art and recommended to the public under any general name or title as a specific for any disease."

Importation of "Opium."

The public was informed by Government Notice No. 27, published in the *Gazette* of February 10th, 1922, that orders for drugs coming under the Opium Proclamation, No. 24 of 1920, must be submitted in triplicate to the Principal Medical Officer in order that a certificate as required by the law in the United Kingdom may be given.

MAFIA ISLAND.

This island, formerly part of German East Africa, was administered by the Government of Zanzibar until October 30th, 1922. On November 1st its administration was transferred to the Government of Tanganyika Territory.

WITCHCRAFT.

Ordinance No. 32 of 1922, providing for the punishment of persons practising so called witchcraft, was published in the *Gazette* of December 8th, 1922.

LUNATICS.

The Indian Lunacy Act of 1912, excepting Chapter V., was applied to the Territory by Ordinance No. 7 of 1920. By Government Notice No. 249, published in the *Official Gazette* of November 17th, 1922, asylums were established at all first and second class prisons and all First Class Magistrates were empowered to perform the functions of Magistrates under the Indian Act. This measure obviated the difficulty of sending lunatics great distances to the only asylum in the Territory.

Legislation of sanitary interest is dealt with by the Senior Sanitation Officer in his report.

J. B. DAVEY,

Principal Medical Officer, Tanganyika Territory.

EXTRACT FROM THE REPORT FOR 1922 OF THE GOVERNMENT DENTIST.

This report for the twelve months ending December, 1922, together with the attached summary of work done for officials and their families, gives a brief account of the stations visited and the nature of the treatment given.

It will be observed that the work, which is chiefly conservative, continues to increase.

Local conditions make it necessary for the writer to spend a great part of each year at the capital, but the intention expressed in his report for 1921 has been carried out and a number of out-stations have been visited.

In January, Kigoma and Tabora were visited; Tanga, Lushoto and Arusha in June; and Moshi, Bukoba and Mwanza in July.

At the request of the Principal Medical Officer, Zanzibar was visited in September for a few days.

Tabora was visited again in November; much to the writer's regret there has been insufficient time to visit the southern area of the Territory.

The necessity of regular dental examination is again emphasized; much of the dental trouble in later life would thus be avoided. Officials visiting Dar-es-Salaam should avail themselves of the opportunity, and officers on transfer from Dar-es-Salaam to other stations, prior to their departure.

A number of officials and their families from Zanzibar have been treated.

The Asiatic Staff of the Government requiring treatment have been attended to, and also a considerable number of natives; early in the year the native school children were inspected twice and treated. The writer regrets that no time was available later in the year to continue the work.

The list below refers to the European officials and their families of the Territory:—

Attendances	1,133
Fillings	485
Extractions	192
Scalings	111
Pulp treatment	48
Dentures	33
Repairs to Denture	38

APPENDIX No. 1.

LUTINDI LUNATIC ASYLUM.

ANNUAL REPORT FOR YEAR ENDING DECEMBER 31ST, 1922.

I.—STATISTICS.

	Male.	Female.	Total.
Number of patients on December 31st, 1921 ...	55	31	86
Number of patients admitted since December 31st, 1921	21	2	23
Number of patients discharged since December 31st, 1921	10	2	12
Number of deaths since December 31st, 1921 ...	10	2	12
Number of patients remaining on December 31st, 1922	55	30	85

Average length of stay of those discharged—3, 2-12 years.

Average length of stay of those who died—1, 11-12 years.

II.—ADMISSIONS.

The majority of those admitted were suffering from insanity associated with delusions.

One male child was admitted.

One male was re-admitted after an absence of four months.

III.—HEALTH.

The general health has been satisfactory. There was an outbreak of dysentery in January caused by the admission of a male patient with the disease, seventeen males were attacked; four died, the remainder were treated as directed by the Senior Medical Officer, Tanga, and recovered. There has been no casualty worthy of note and no case of ill-treatment has occurred during the year.

IV.—MAINTENANCE.

The cost of maintaining each patient per day is now Shs. -/30. Weighing and rationing of foodstuffs and a favourable season for crops enabled economies to be made.

V.—EMPLOYMENT.

The majority of the patients are usefully employed daily. The acute cases appear to derive benefit from exercise in the fields, and it has only been necessary to dispense 80 grains of sedative during the year.

The buildings are being renovated, cement floors laid and drains constructed by the labour of patients directed by one fundi employed for the purpose.

VI.—VISITORS.

The Administrative Officer in charge and Assistant Administrative Officer, Usambara, inspected the asylum during the year. Both offered suggestions regarding disbursements, which have been acted upon with satisfactory results.

The Principal Medical Officer made a tour of inspection. His suggested improvements in sanitation and disposal of refuse are being put in hand.

VII.—GENERAL.

Supplies of medical stores have been received from headquarters.

Cement, lime and paint have been received from the Public Works Department, Tanga.

1,075 natives received out-treatment and medicine during the year.

J. SPITTLES,
Superintendent, Lutindi Lunatic Asylum.

APPENDIX No. II.

THE ANGLO-BELGIAN BOUNDARY COMMISSION.

A series of interesting reports have been received from Sub-Assistant Surgeon Kelkar, who was seconded from the Medical Department to accompany the Commission. These reports to December 31st, 1922, are summarised below :—

The Commission assembled at Kigoma, the terminus of the Central Railway, on Lake Tanganyika, in September, 1922, and marched in a northerly direction through Kasulo, Kibondo and Lukira to Shonga.

The British Personnel of the Commission consists of :—

European Officials	7
Asiatic Officials	1
Native Officials (Escort, clerks, etc.)	42
Native Followers (Including porters, personal servants, etc.)	375

Table of Diseases Treated.

The health of the members of the Commission has been good; the illness amongst the native staff have been largely due to change of diet and altitude. Table H shows the cases which have been treated from September 31st, 1922.

Entomological Observations.

Glossina.—G. Morsitans was observed on several occasions before Kasulo was reached, and again several times between that station and Kibondo. Later, it was found at the Rovuvu River and on both sides of the Kagera River. On the Kagera River it is known to be present over an extensive area, but the tsetse fly map in the Principal Medical Officer's Office, an old German one, shows only one small patch on the Malagarassi River and a narrow belt in the vicinity of Kibondo. It is evident, therefore, that tsetse fly is much more widely spread than the map indicates. *G. Brevipalpis* was found on approaching the Malagarassi River and on the day after it was crossed. Kasulo, a sub-station of Kigoma, is at an altitude of about 4,500 feet, and tsetse was not found within several hours' march of it.

Ornithodoros moubata was discovered at several camping places on the line of march—first at Kasulu (4,470 feet).

Auchmeromyia luteola.—The finding of the " Congo floor maggot " may be given in Sub-Assistant Surgeon Kelkar's own words :—

> " The search was really meant for ticks in response to the various complaints of the boys being bitten by some insects in the night-time. The flies themselves were found sitting quietly on the inner sides of the roofs of the tents. These larvæ seem to be nocturnal in their habits and do not adhere to the part like ticks, and hence they are very difficult to be caught in the act of biting. At the seat of the bite is produced a papular eruption about a rupee size in extent. This patch of eruption is very itchy. I saw two cases amongst the local native children where the whole body was full of this eruption (resembling scabies) caused by the bites of these larvæ."

Collections including a simulium, anopheline mosquitoes and a species of cimex, have been made. The identification of the entomological specimens requires confirmation.

ENDEMIC DISEASES.

Leprosy was found to be common amongst the natives, especially about Kibondo, where, of 500 local porters examined, ten were found to be lepers.

Syphilis and, to a less extent, *gonorrhœa* are reported by Sub-Assistant Surgeon Kelkar to be very prevalent. Of 40 sick brought in by the local headman to one camp for treatment, 27 were cases of syphilis. *Yaws* is also common.

Gangosa, under the name of " Destructive Ulcerous Rhinopharyngitis," the following description of 12 cases under treatment at Shonga is given :—

> " The disease begins with a severe headache on one or both sides of the supra-orbital region. Acute rhinitis with blood mixed nasal discharge sets in, the pain continuing the same ; in some cases there are pains in joints side by side. The discharge becomes more and more foul-smelling ; in a couple of months the bridge of the nose sinks and gives it a peculiar appearance like a Turkish saddle, and the supra-orbital regions of the frontal bones are raised up and sometimes become uneven. Then the destructive process begins in the naso-pharynx and the voice is impaired, giving it a peculiar twang in the vocal symphony. As time goes on the tip of the nasal cartilage is affected and becomes black like a gangrene discolouration, and subsequently the nasal septum. The lips are not affected, but when the nasal cartilage and the septum is eaten up, the infection begins to spread downwards

towards the throat; the larynx is involved and in some cases the lungs, and the patient expectorates gangrenous sputum, and side by side general health is affected. When the nasal cartilage is eaten up the bridge-bones are exposed, which are necrosed and loose and exude a purulent discharge. Whenever the nasal discharge is rubbed by the patient on any part of the body, an ulcer is formed.

" Out of the group, only two gave history of yaws ten and 12 years ago, and one gave history of syphilis—nine years ago. The patients are all between the ages of 30 to 40 years, both sexes. There seems no apparent connection between this condition and yaws and syphilis. The affected mother bears a perfectly healthy child.

" Diet in general of the natives affected is: Banana flour, curdled milk, sweet potatoes, beans and ulezi. Chief occupation is looking after cattle. The houses they live in are round and peculiarly dome-shaped grass huts closed all round with a very small hole as an entrance. The centre is about seven to eight feet high. Their milk pots and jugs, etc., are always in the same hut, swarmed with flies, and surrounding this or near it is the cattle kraal full of cow-dung.

" The disease is endemic up to Gaboris on this side and peculiarly extinct when we cross the Uganda border. The natives say that out of the approximate population of this area (5,850) more than 200 will be found suffering from this disease.

" Nasal injections of chloroform have also failed to extricate screw worms. Intravenous injections of antimony tartrate are being given, but do not seem to produce hopeful results. Under separate cover I am sending slides for examination by the Director of Laboratory."

Note.—The Director of Laboratory, Dar-es-Salaam, reported that six out of ten films made from the nasal discharge showed " marked infection with Vincent's organisms, which are very commonly found in tropical ulcers. There was no evidence of leprosy or tuberculosis."

Tropical Sloughing Phagedœna.—Many cases have been seen amongst the natives. From Sub-Assistant Surgeon Kelkar's account some of these were evidently severe cases. He found " numerous fusiform and spirilla " in scrapings. No evidence of leishmania was found by the Director of Laboratory in films from scrapings of these ulcers sent to him, but the findings of Sub-Assistant Surgeon Kelkar were confirmed. Deformities, *e.g.*, talipes, are common. The local natives were found to be severely infected with scabies. Ulcers resulting from jigger flea infestation are numerous.

Evidently there is great need for medical work amongst these people who are remote from skilled attention. As far as is consistent with the execution of his regular duties, Sub-Assistant Surgeon Kelkar has attended their ailments. Native dressers are stationed at Kasulo and Lukira, sub-stations of Kigoma and Bukoba districts respectively, to attend to minor injuries and complaints amongst the native police and other Government employees.

TABLE H.

	European Officials.	Asiatic Officials.	Native Personnel.	Native Popaultion.	Total.
Malaria	1	1	12	17	31
Gonorrhœa	—	—	—	11	11
Syphilis · Primary	—	—	1	37	38
,, Secondary	—	—	—	6	6
,, Tertiary	—	—	—	12	12
Yaws	—	—	2	16	18
Gangosa	—	—	—	15	15
Conjunctivitis	—	—	—	12	12
Iritis (Syphilitic)	—	—	—	2	2
Otitis Media	—	—	—	5	5
Coryza	2	—	15	12	29
Bronchitis	1	—	112	74	187
Emphysema	—	—	—	1	1
Pleurisy	—	—	—	1	1
Dental Caries	1	—	7	12	20
Pyorrhea Alveolaris...	—	—	1	—	1
Tonsilitis	1	—	—	4	5
Pharyngitis	—	—	—	4	4
Diarrhœa	—	—	53	123	176
Constipation...	1	—	40	47	88
Dyspepsia	—	—	2	4	6
Ascites	—	—	—	1	1
Hæmorrhoids	—	—	—	1	1
Suppuration Lymphatic Gland ...	—	—	3	5	8
Enlargement of Spleen	—	—	—	1	1
Soft Chancre	—	—	—	4	4
Orchitis	—	—	—	1	1
Arthritis	—	—	10	4	14
Ingrowing toe nail	1	—	—	—	1
Cellulitis	—	—	2	9	11
Abscess	—	—	—	7	7
Sinus	—	—	—	1	1
Scabies	—	—	6	63	69
Boils	1	—	—	1	2
Eczema	—	—	—	8	8
Ulcers	—	—	—	7	7
Tropical Sloughing Phagedæna ...	—	—	—	110	110
Injuries	9	—	187	382	578
Tænia...	—	—	4	20	24
Ankylostomiasis	—	—	—	1	1
TOTAL	18	1	457	1,041	1,517

APPENDIX No. III.

FURTHER REPORT UPON TREATMENT WITH BISMUTHO SODIUM AND POTASSIUM TARTRATE.

In the Annual Report for 1921 some notes on the results obtained by the use of this remedy, chiefly in cases of yaws, were published by the Acting Principal Medical Officer. The observations therein recorded were made during the year now under review and those to be related below complete the record for 1922.

The preparations employed during 1922 were those made locally by Mr. T. G. McGowan and mentioned in the notes referred to above. A small quantity was prepared in the Laboratory by the Acting Director, but I am not aware that this was issued. Two batches were prepared by Mr. T. G. McGowan, and it would appear that the second gave rise to toxic symptoms more readily than the first. The Director of the Laboratory, upon his return from leave towards the end of the year, tried the method of preparation furnished by Mr. T. G. McGowan, but did not find it satisfactory. He states that "very often the precipitate obtained" (on adding spirit) "appeared to be only cream of tartar." He has since prepared 100 grammes by a method of his own. This was not issued in the year under review.

An extract from the article in the "Journal des Practiciens," published in the "Practitioner" in September, 1922 (No. 651, Vol. CIX., No. 3, page 258), and discussion with the Director of the Laboratory raised some doubt in my mind as to the nature of these preparations. Professor Warrington Yorke, to whom the subject was mentioned in a letter, kindly put me into communication with Messrs. Martindale, of New Cavendish Street, who informed me that an examination of the French literature does not make it clear that the substance is a combined sodium potassium compound, a possibility which seems to have occurred to the Acting Principal Medical Officer (see Annual Medical Report, Tanganyika Territory, for 1921, page 61). A recent article by Levaditi in the "Lancet" (March 31st, 1923) recommends the use of basic tartro-bismuthate of potassium and sodium (trepol), but states that it is insoluble. He advises intramuscular injections and condemns the intravenous route as dangerous. The substance used in this Territory is soluble in water with or without the addition of alkali, and has been given by intravenous injection except when stated otherwise. Recently a substance prepared by a firm of chemists in England and sold as sodium potassium bismuthyl tartrate has been used and in reduced doses of gr. ii has given satisfactory results at the Sewa Hadji Hospital.

Small supplies of bismuth sodium tartrate and of bismuth potassium tartrate are on order for a trial. The former has, I understand, been employed at the Liverpool Royal Infirmary.

The results reported in the treatment of yaws, tick fever, syphilis, sleeping sickness and small-pox are recorded below. Except when stated otherwise it may be assumed that six grains was the dose employed.

Yaws.—The Senior Medical Officer, Tanga (Dr. Suffern), reports that 14 cases were treated; ten were improved, three showed no improvement. There is no record of the progress of one case. In his opinion B.S.P.T. is much less efficacious than neokharsiven; in consequence, the patients return for subsequent injections less readily. No record of the amount or number of doses of the drug which were administered are given. No toxic symptoms were observed.

The Medical Officer, Bukoba (Dr. Williams), treated six cases of "a pustular eruption," with a history of antecedent pyrexia and headache. Three injections of grs. vi each were administered at weekly intervals. One of the cases developed severe diarrhœa and died; three cleared up slowly and two "almost immediately." Seven months later three of the survivors returned with a similar pustular eruption, which disappeared "at once" after an injection of neokharsivan. The Medical Officer is in doubt as to the diagnosis of these cases, at first believed to be small-pox, but, on further consideration, yaws. From his account it is not possible to decide this point, but the diagnosis of small-pox does not commend itself. One other case, of yaws, which was lost sight of, was treated.

The Medical Officer, Lindi (Dr. Haworth), administered two injections to a case "without apparent benefit." The patient ultimately died, and at autopsy, in addition to the lesions of yaws, tuberculosis of mesenteric glands was found.

The Medical Officer, Dodoma (Dr. D. S. Scott), has had "very good and encouraging" results. With the second supply of the remedy, bad after effects, especially stomatitis, were frequent; in two instances this was severe. He had the misfortune to have three fatalities: one, an old Indian trader, died suddenly 15 minutes after receiving his first injection of grs. iv; he was the subject of arteriosclerosis. Two women died 11 and 12 days respectively after receiving an injection of grs. vi; post-mortem, acute generalised gastro-enteritis was found; their condition prior to injection was poor. No information as to the total number of cases treated is supplied, and the Medical Officer has not been able to keep track of them. Compared with treatment by N.A.B. and mercurial inunctions, cure is, he considers, more rapid. He has latterly injected not more than grs. iii for a dose.

The Sub-Assistant Surgeon, i/c Morogoro, reports that a few cases have been treated by injections of grs. vi; no toxic symptoms were observed. The worst cases cleared up in six days. He considers it is more efficacious than neokharsivan.

The following extracts from the valuable and detailed reports of Dr. Shelton, Medical Officer, Arusha, are of special interest:—

" During the last eight months I have received two separate supplies of this drug:—

" (*a*) A supply sent in May, 1922.

" (*b*) A further supply in October, 1922.

" These two samples appeared to differ in certain respects:—

" 1. *Appearance.*—(*a*) Was definitely more crystalline, while (*b*) was in more granular form.

" 2. *Solubility.*—I found it practically impossible to dissolve sample (*a*) without previously adding a solution KOH (and then only after prolonged boiling); (*b*) dissolved readily without any addition of alkali.

" 3. *Efficacy.*—(*a*) Appeared to be distinctly more efficacious than (*b*).

" *Diseases treated.*—With supply (*a*) 18 cases of typical secondary yaws were treated:—

Name.	Sex.	No. of Injections.	Days in Hospital.	Result on discharge.
Nakulali	M.	4	27	Cured.
Buza	M.	2	13	,,
Hassani*	M.	2	14	,,
Kilele	M.	2	11	,,
Narishu	M.	2	18	,,
Saidi	M.	2	23	,,
Nurumbe	M.	2	20	,,
Chumbi	M.	2	13	,,
Nassari†	M.	2	15	,,

" In addition nine cases were treated as out-patients. These cases I found very unsatisfactory. Most of them attended for one injection only, one or two for two injections at irregular intervals. I think it is reasonable to suppose that some of these patients did not attend a second time because they were greatly improved or cured.

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* Relapsed one month later. Refused further treatment.

† Seen two weeks later, free from relapse.

" 'Cured' means that patient left hospital free from any outward signs of their disease, *i.e.*, moist papules and tubercles had dried up, crusts fallen off, etc.

" METHOD OF ADMINISTRATION.

" Dose for adults: 6 gr. intravenously.

" I have found it most satisfactory to dissolve the dose of the salt in a fairly large amount of distilled water, *e.g.*, 6 gr. to 5 to 8 c.c. of water. I found it extremely difficult to dissolve the drug without previous neutralization with K.O.H.

" No ill effects were noted except in one case, that of Hassani. After the first injection this man complained of severe pain in the arm, cough, slight collapse; he recovered in a few minutes. One patient had some swelling at the site of injection; this subsided in two days without any signs of suppuration.

" CONCLUSIONS.

" The number of cases treated is so small that I hesitate to put forward any conclusions. I can only say that intravenous injections of 'Bismutho Sodium Potassium Tartrate' do appear to clear up the lesions of yaws, and I think that this drug is well deserving of a more extensive trial.

" I am unable to say to what extent cases may subsequently relapse.

" I do think this is quite so efficacious as neosalvarsan and its allies, but it is no harder to administer and apparently has no bad after effects, certainly it should be much cheaper. One injection I have not found to be sufficient to bring about a speedy relief of symptoms, my cases requiring two or even more doses.

" With supply (*b*) thirty-seven cases of secondary yaws were treated with the following results:—

" Five were free from all clinical signs of the disease after a course of treatment (three injections in four of the cases; four injections in the fifth case).

" Twelve cases were definitely improved after three injections and were then lost sight of.

" Fifteen cases showed some improvement after one or two injections, after which they ceased to come for further treatment.

"Five cases showed no appreciable improvement (one case having as many as six injections, the remaining cases having three or four each).

"With supply (*b*) I found a larger number of injections was needed to produce an effect than was the case with (*a*).

"*Dose.*—Six grains dissolved in five c.c. of distilled water and given intravenously. Correspondingly reduced doses for children. Injections repeated after four or five days.

"*Toxic effects.*—Two cases (one with (*a*) and one with (*b*)) showed symptoms of vomitting and slight collapse after injection, but recovered in a few minutes.

"No local reactions were noticed and no fatalities occurred. Although a certain number of cases of undoubted yaws were apparently cured of all outward signs of the disease, I do not think that this drug is as certain or as speedy in its effect as neosalvarsan and its allies. I should also like to have been able to obtain statistics as to the permanence or otherwise of the apparent cures."

The report by Dr. J. M. Semple, Medical Officer, Sewa Hadji Hospital, Dar-es-Salaam, is reproduced *in extenso* :—

"*Yaws.*—It is in this disease that the best and most constant results have been obtained. The majority of cases treated have been those in the secondary stage, with well-developed yaws scattered to a greater or less extent all over the body.

"The average amount of the salt given per case was 18 grains, *i.e.*, six injections of three grains each, twice weekly. After the second injection and in many cases on the second day after the first injection, the yaws and papules showed a slight black pigmentation and tendency to dry up. This progressed with each injection until every yaw had disappeared, leaving only a slightly darkened patch on the skin to mark its site."

Tick Fever.—The following records of cases which have been treated with B.S.P.T. have been received.

The Medical Officer, Arusha, reports that he treated one case of Relapsing Fever with supply (*b*); he remarks: "Seeing that this case still had spirilla in the blood for two days after injection and suffered a relapse nine days later, it does not appear as if the drug had any effect in this case. It should, however, be noted that, in the second attack, the temperature was still raised and spirilla were present in the blood the day after injection of Neokharsivan."

The Senior Medical Officer, Tabora, treated a native servant with one injection: the patient proceeded to the coast on the fifth day and he had no further record of him.

I am informed by his employer that this man had no relapse. (J.B.D.)

The Medical Officer, Sewa Hadji Hospital, reports that several cases were given two doses of three grains and apparently cured by it.

Syphilis.—The Senior Medical Officer, Tabora, Dr. C. L. Ievers, treated five cases; in two the condylomata had disappeared by the ninth and tenth days after injection; in one a secondary papular eruption began to fade six days after injection (combined with mercurial treatment); in two—girl aged 14, boy aged 9—the primary chancres had disappeared on the ninth and tenth days after injection without other internal medication; to each of these five cases was administered one injection of grs. VI.

The Senior Medical Officer, Tanga, treated one case; it was "much improved."

The Medical Officer, Dodoma, has treated cases of syphilis (number not stated); the remarks made on the efficacy of the drug in yaws apply to syphilis.

The Sub-Assistant Surgeon, Morogoro, has treated a few cases and found B.S.P.T. less efficacious than Neokharsivan.

The Medical Officer, Sewa Hadji Hospital, states that the results obtained in the primary stage were only moderately good. Chancres did not heal up under about 12 injections, but as a rule the secondary rash did not appear in these cases. Patients admitted with a secondary rash took four or five injections before the rash disappeared, and were given two or three more before being discharged. Cases with tertiary manifestations generally required up to fourteen or fifteen doses to make any very marked improvement. On the whole the results obtained in secondary and tertiary cases were very much better than in primary cases.

Sleeping Sickness.—The Medical Officer, Mwanza, reports that he treated five cases of trypanosomiasis (T. rhodesiense infection) with this preparation in doses of grs. VI. intramuscularly. One case (advanced) was given injections every tenth and eleventh day from 21st September, 1922, to 1st December, 1922; he died on 10th December, 1922; two (moderately advanced) were treated by injections every third day; after five injections one had lost ground and the other died after 10 injections. Two were given daily injections for seven days, one of them a fairly advanced case, died two days after the last injection; the other, who showed few symptoms of the disease but in whose blood trypanosomes had been found, was still fit three months after the last injection, and four subsequent blood examinations yielded negative results.

Small-pox.—One case was treated by the Senior Medical Officer, Tabora; it ran a benign course. The permanganate treatment advocated by Dr. Andrew Balfour has been found so effective that B.S.P.T. has not been tried again.

Eczema.—One case was treated by the Medical Officer, Sewa Hadji Hospital; this was in an Indian male adult, in whose case the entire lateral aspect of the right leg was affected with eczema madidans. He was given one injection of three grains besides local treatment with boric foments. The eczema had dried up in three days after the injection and within a week the patient was discharged cured.

Pemphigus.—One case was treated at the Sewa Hadji Hospital. He was a native male adult. Sixteen doses of three grains each were given. During treatment several new crops of bullæ appeared as others healed, but each successive crop was smaller than the last, and eventually all signs of the disease disappeared. The patient was kept under observation for fifteen days after apparent cure and, no further signs of disease appearing, was discharged.

Summary and Conclusions.

The doses originally employed were too large; two, or at most 3, grains is a suitable dose for adults. The administration of large doses by the intravenous route is attended with danger. In debilitated patients great caution should be exercised and reduced doses employed. Watch must be kept for symptoms of poisoning, especially stomatitis, which are by no means uncommon. It is probable that the composition of some preparations changes in the course of a few weeks unless kept thoroughly dry. There can be no doubt that the two preparations used were not of identical composition; it would be rash to dogmatise on the efficacy of bismuthous sodium potassium tartrate without better evidence that it was the substance supplied by the M.O.'s whose opinions are recorded.

The preparations employed showed definite curative effects in case of yaws; how far the "cures" were permanent it is not yet possible to say. Secondary yaws is so remarkably amenable to treatment with arsenicals that, except on the score of expense, there can be little question which treatment is to be preferred. Had it been possible to keep more of the patients under observation it is doubtful whether better results than those recorded by Dr. Reid in the Annual Report for 1921 under the tartar emetic method would have been disclosed.

In syphilis the results are somewhat disappointing; but little effect is produced on the primary lesion and tertiary lesions are very resistant.

Of tick fever and sleeping sickness the cases recorded are too few to warrant any definite conclusions, but it is very doubtful whether any beneficial effect is produced in the latter.

J. B. DAVEY,
Principal Medical Officer.

APPENDIX No. IV.

CONTINUATION REPORT ON THE TREATMENT OF YAWS BY C. B. B. REID, M.B., CH.B. (EDIN.), TUKUYU.

Yaws.—This has been the most prevalent disease in the district during the year. The number of cases treated was 799, of which 674 were cured, 3 died, 70 were improved, 7 were not improved, and 45 remained at the end of the year.

There is great need for an increase in the amount of Neokharsivan supplied for the district. Only 356 ampoules were received, whereas it was found necessary to administer 2,830 intravenous injections during the year.

Tartar Emetic in solution was used for these injections, and the results were fairly satisfactory. although the time necessary and the number of injections required to affect a cure is much greater than when Neokharsivan is used. The dosage used was 2½ grains to commence with, increasing gradually to 4 grains at weekly intervals. This is the dosage for adults. There were no cases of emesis as a result of this dosage, though salivation was fairly common. In addition, mercury was given by the mouth daily. At the beginning of the year mercury was administered intramuscularly, but this had to be discontinued when the supply of mercury cream finished. Severe abscesses occurred as a result of the tartar emetic injections in four cases, the cause being missing of the veins.

Over 72 per cent. of the cases of yaws came from the low-lying portion of the district, on the shores of Lake Nyasa, this area stretching a distance of from forty to a hundred miles from Tukuyu.

APPENDIX No. V.

THE MALARIAL PARASITE INDEX AMONGST NATIVE CHILDREN OF ARUSHA AND SURROUNDING DISTRICT, BY C. F. SHELTON, M.D. (LOND.).

With a view to forming some idea as to the amount of indigenous malaria in the immediate vicinity, I have recently examined for M.P.'s blood from 50 children. With two exceptions, noted as below in (1), these cases were all under the age of 10 years or so.

(1) The Arusha school children were inspected (688 in number, with ages from about 6 to 16). Nineteen of these children I picked out as comprising all the schoolboys of 10 years and under. Two were selected, although aged 14 to 15, on account of splenic enlargement. Of these 21 cases 4 gave positive results, viz. :—

Case No.	Age.	Spleen.	Parasites.	Birth place.
10	9 (about)	1 in.	Crescents.	Moshi.
15	14 ,,	Palpable	B.T.	Arusha.
18	8 ,,	1½ ins.	B.T.	D.-es-S.
20	15 ,,	2 ins.	B.T.	Moshi.

Cases 10, 18 and 20 had fairly recently been out of the district; case 15 was born in Arusha, and stated he had never left the vicinity. (2) 29 children, varying from a few months to about 10 years, were picked out at random from amongst the out-patients. As far as possible I tried to make certain that each child had been born in Arusha district and had not left it.

The results were as follows :—

1. Splenic index. *Nil.*
2. M.P.'s in blood. One case (No. 28) Benign Tertian.

Further questions showed that this child had been born near Moshi, and had made occasional visits there.

METHOD OF EXAMINATION.

One fair sized drop of blood (fourth from the ear) taken and spread into a thin film. One slide only from each case. Stained with Leishman. 200 to 300 " fields " examined in each slide.

SUMMARY.

50 cases examined, 48 being under 10 years of age (approximately), 5 cases showed M.P.'s (4 benign tertian, 1 subtertian) and 4 of the above also had enlarged spleens. With one exception (noted in I.) all these positive cases were born out of the district and had had opportunities of becoming infected elsewhere.

APPENDIX No. VI.

TWO CASES OF INTEREST FROM ARUSHA DISTRICT,

BY C. F. SHELTON, M.D. (LOND.).

1.—A case of appendix abscess in a native. Salim, M., age about 18. A native of Moshi. Admitted, 8th November, 1922, H.P.I. For "about a year" had suffered from repeated attacks of pain in the lower abdomen—often accompanied by vomiting, and he thought "fever." Was not certain as to the exact number of attacks, but they were nearly always bad enough to prevent him from working. Present attack commenced about twelve days previous to admission, and he was carried to hospital.

On examination—G.C. Fair, T. 101.8, Pulse 80. Abdomen very tender and rigid in Right Iliac Quadrant. An indefinite mass was felt in this region. Tongue moist but furred. Nil per rectum. Operation, 8th November, 1922. Under the anæsthetic a very definite mass was felt, sit. internal to and below McBurney's point. Right Rectus Incision made. After opening the parietal peritoneum and packing off the intestines I found a large abscess, sit. internal to and below the cæcum. Abscess not adherent to the parietal peritoneum, but well surrounded by omentum. After careful packing the abscess was opened and about 1 oz. of thick offensive pus, with a typical "B. Coli" smell, was evacuated. Cavity drained with two rubber tubes, surrounded with some gauze packing. No attempt made to identify and remove the appendix. Patient has made a good recovery. On 1st December, 1922, the abdominal incision was soundly healed. The last drainage tube was removed on the fifteenth day after operation. Patient refuses a second operation to look for the appendix, as he "feels quite well now." I think this abscess was undoubtedly Appendicular in origin.

2.—Double pyosalpinx. Laparotomy c. removal of pus-tubes. Death from general peritonitis on the fourth day after operation. Patient a Mbulu native, aged about 20, was admitted to hospital on 11th November, 1922 (with a purulent vaginal discharge and the signs and symptoms of a double pyosalpinx. As her condition after admission steadily became worse, in spite of palliative treatment, the abdomen was opened on 17th November, 1922. Mid-lines suprapubic incision made. On exploring the pelvis two large tubo-ovarian abscesses were found, situated in the usual relation to the uterus, *i.e.*, postero-lateral and extending down into the pouch of Douglas. These pus-sacs were adherent to surrounding structures, especially below, where they were separable with great difficulty from the rectum. During their removal I ruptured both of them. Thick non-offensive pus escaped, although this was mopped up as quickly as possible, and although the pelvis had previously been packed off, I fear some of the pus escaped and infected the general peritoneal cavity. Moreover, the operation was a long and difficult one, and it is quite possible that I introduced sepsis from without. Suprapubic drainage was employed.

I regret to have to say that death occurred on the fourth day after operation.

P.M. showed general peritonitis. No injury to the rectum. While gonorrhœa is not uncommon amongst women here, pelvic complications appear to be quite the exception.

From the history and physical signs I think this case was of gonococal origin.

APPENDIX No. VII.

TREATMENT OF BILHARZIASIS BY RECTAL AND VESICAL INJECTIONS OF TARTAR EMETIC.

Report by Dr. D. S. Scott, Medical Officer, Dodoma.

Seven cases of this disease were under treatment during the year. There was one case of schistosoma mansoni and the others were schistosoma hæmatobium. They were treated by the rectal and urinary bladder administration of tartarated antimony with success.

Dr. H. F. Wilson published an article in the *British Medical Journal* of 28th January, 1922, in which he advocated the treatment of bilharziasis by the rectal administration of tartarated antimony instead of intravenously. I had the opportunity of meeting him, when he informed me that he was giving up to 20 grains as far as I can remember. I had a case soon after of schistosoma mansoni to whom I gave 10, 15, 20 grains of tartarated antimony with a day's interval between. No ova were seen after this and I examined his fæces on the 25th January, 1923, and found no ova. Then I had six cases of schistosoma hæmatobium, to the first of whom I gave at first 15 grains of tartarated antimony, followed by 20 grains, with a day's interval. To the latter cases I have given as an initial dose 20 grains of tartarated antimony without any bad after effects. One case received per rectum 105 grains of tartarated antimony, but still ova were found in the urine. As it seemed to me that the parent worms were not being reached by the tartarated antimony as administered per rectum owing to their having found their way into the deeper veins of the wall of the urinary bladder which were enlarged owing to the associated cystitis, I decided to give 25 grains of tartarated antimony into the urinary bladder. I repeated this dose after a day's interval and the ova disappeared from the urine. One case had a relapse after 16 days. He was given 20 and 25 grains of tartarated antimony into the urinary bladder with good results. The ova disappeared from the urine.

Five of the cases were re-examined at the end of January, 1923, after an interval of from two to four months after discharge from hospital. In one case ova were found and the other two cases could not be found in order to examine the urine. The above case in which ova were found had been to Bahi, where many natives are said to be passing blood in their urine but have no temperature. It seems as if this place may be infected with bilharziasis. This is being investigated.

This case received in all 100 grains of tartarated antimony into the urinary bladder, but still ova were found. He was given at the same time the following mixture :—

℞

Sod. Benzoat	gr. x.
Urotropin	gr. x.
Liq. Strychnin. Hydrochlor	m. iii.
Tr. Belladonnæ	m. v.
Aq. ad.	oz. i.

1 oz. t.d.s.

This had the effect of reducing the phosphates and the alkalinity of the urine. I think that this by relieving the cystitis had the effect of reducing the blood vessels (and also their powers of absorption) of the wall of the urinary bladder and so the tartarated antimony could not get at the parent worms. He was then given two doses of 25 grains of tartarated antimony per rectum with a successful result. The ova disappeared from the urine.

The urine in all cases is examined microscopically on three successive days and three negative results obtained before the patient is discharged as cured from hospital.

The patient is made to empty his urinary bladder if the dose is to be administered in that way and an enema of soap and water is given to empty the rectum if the dose is given that way. In all cases the patient lies down for two hours after the dose is given and must not urinate or go to stool during that period. The patient should lie on the left side during the rectal administration of the dose and for the two hours afterwards.

TANGANYIKA TERRITORY.

Annual Report

Sanitation Branch of the Medical Department, 1922.

INTRODUCTION.

In this Report, the third submitted on the work of the Sanitation Branch, an attempt has been made to follow the lines of the Senior Sanitation Officer's Report for 1921. Certain sections, fully dealt with there, such as "Climate in Relation to Health," "Hill Stations," and other matters of general interest which do not vary from year to year have not been included. The writer of the present Report arrived at Dar-es-Salaam on December 26th, 1922, on first appointment, and in consequence has not been able to write from personal observation. From the information available it appears that considerable progress, at least in urban sanitation, has been made during 1922.

The question of the extension of public health work in the future is entirely dependant on the staff and funds available. The only Medical Officers of Health in the Territory are stationed at Dar-es-Salaam and Tanga. Their time is fully occupied in supervising the sanitation of these towns and in the sanitary control of the ports. They are quite unable to visit outlying districts in order to educate the peasantry into more sanitary habits of life. This also applies to the Medical Officers stationed in the larger towns who cannot visit their districts except in cases of emergency.

The pressing problems of ankylostomiasis, leprosy, venereal disease, sleeping sickness and the efficient control of vaccination cannot be solved until a much larger staff is available.

In the towns great improvement may result after the new Township Rules have been published. . These give powers to Township Authorities which, if properly applied, will remove many of the insanitary conditions which prevail to-day. The habit of storing grain, cotton and other articles in living rooms attached to small Indian shops must be stopped if plague is to be averted. Rat proof stores and bins must be brought into use for the storage of rat-attracting produce.

The present native quarters, represented in many townships by crowded collections of huts without any semblance of proper streets, will have to be altered. No old building should be repaired nor a new one built without a permit which should not be granted unless the position of the site is in accordance with an approved plan. The following extract from a recent report by the Medical Officer of Health at Tanga gives a good idea of the difficulties under which the sanitary department labours :—"Up to the end of the month 173 buildings had been inspected, and it was found that only three of the natives concerned could produce permits from the Building and Town Planning Committee. Within the past three years, previous to the Building and Town Planning Regulations coming into force, a number of huts have been erected in the Tabora section of the village without any idea of line or symmetry, and in some cases houses have been built in the centre of the public thoroughfares." Similar conditions obtain in many of the older towns, but if the new rules are properly enforced great improvement should result.

In the districts little can be done at present except by the spread of education. As already stated, it is quite impossible for the present staff to visit the villages; we can only hope that the lectures delivered to the present generation of school children on sanitation and infectious disease will result in improvement in the sanitation of their present and future homes.

While the Annual Reports submitted by all members of the Medical Department in charge of stations have been used in compiling this record of the year's work, the Senior Sanitation Officer expresses his indebtedness in particular to the under-mentioned officers whose reports, or extracts therefrom, are included :—

Mr. A. M. D. Turnbull, Senior Commissioner, Mwanza. Reports on Sleeping Sickness in the Mwanza district.

Dr. R. Nixon, Medical Officer of Health, Dar-es-Salaam. Report on the Sanitation and Health of Dar-es-Salaam

Dr. A. I. Meek. Report on the Sanitation and Health of Tanga.

Dr. C. L. Ievers, Senior Medical Officer, Tabora. Reports on Sanitation of Tabora. Infant Mortality and Venereal Disease.

Dr. J. McK. Clark, Medical Officer, Kigoma. Report on the Sanitation of Kigoma and Ujiji.

Dr. G. Maclean, Medical Officer, Mwanza. Reports on Sanitation of Mwanza. Sleeping Sickness in Mwanza district. Venereal Disease in Mwanza district.

Dr. G. A. Williams, Medical Officer, Bukoba. Reports on Sanitation of Bukoba. Venereal Disease in Bukoba district.

STAFF.

The duties of the Senior Sanitation Officer as laid down by the Principal Medical Officer are as follows :—

1. The Chief Clerk will pass to the Senior Sanitation Officer, for his action, reports upon :—

> Anthrax, ankylostomiasis, C.S.M., chicken-pox, cholera, diphtheria, dysentery, the enteric group of diseases, German measles, influenza, leprosy, malaria, measles, mumps, plague, small-pox, scarlet fever, relapsing and tick fevers, typhus, trypanosomiasis, yellow fever, tuberculosis and venereal disease,

and upon Port and Townships sanitary matters, water supplies, markets, infectious diseases hospitals, food inspection and other kindred subjects.

The files will subsequently be passed to the Principal Medical Officer for his information.

Before action is taken upon any matter of unusual or grave import, the Senior Sanitation Officer will consult and advise the Principal Medical Officer.

2. The Senior Sanitation Officer will deal with requisitions for sanitary stores and will make periodical inspections of the headquarter sanitary stores.

3. The Senior Sanitation Officer will prepare the weekly Infectious Diseases Bulletin, the Annual Sanitary Report and Indents on the Crown Agents for Sanitary Equipment, and any other reports on sanitary questions that may be required.

4. The Senior Sanitation Officer will see that a proper record of expenditure is kept under sub-heads :—

> (33) Sanitary Labour; (38) Upkeep of Quarantine and Infectious Diseases Hospitals; (39) Maintenance of Lepers, Lunatics and Incurables; (40) Pauper Burials; (42) Epidemic Outbreaks and Special Sanitary Measures; (43) Oils and Disinfectants; (44) Uniforms for Sanitary Inspectors; and (58) Sanitary Equipment.

that these funds are expended to the best advantage and that the votes are not over-expended.

5. The Senior Sanitation Officer will be responsible for arranging for the training of Native Vaccinators and Native Sanitary Inspectors, and for the allocation of the Asiatic and Native Staff to the various stations. He will consult with and advise the Principal Medical Officer *re* the distribution of the European Staff.

6. The Senior Sanitation Officer will inspect and report upon the sanitary work of members of the department as necessary.

7. The Senior Sanitation Officer is a member of and Secretary to the Central Town Planning and Building Committee and responsible for the minutes of the Committee.

8. The Senior Sanitation Officer will advise the Principal Medical Officer upon any sanitary questions which may arise, will call attention to any matters affecting the public health which, in his judgment, demand attention, and in general reply to correspondence with members of the medical and other departments relating to sanitary matters, signing for the Principal Medical Officer. Such correspondence will be subsequently passed to the Principal Medical Officer for his information.

The staff to deal with these manifold duties in a country three times the size of Great Britain and Ireland is composed of the Senior Sanitation Officer, two Medical Officers of Health and one Sub-Assistant Surgeon or Compounder seconded from the General Medical Staff, seven European Sanitary Superintendents, three non-European Sanitary Inspectors, and a number of partially trained Native Sanitary Inspectors and Vaccinators. In addition the members of the Medical Department who are in charge of stations are responsible for the sanitation of their Townships and supervise the work of the sanitary labourers in so far as they have time to do so. With the present Medical Staff it is impossible to second any more Medical Officers for sanitation work.

The present staff is disposed as follows :—

DAR-ES-SALAAM.

One Medical Officer of Health.

Three European Sanitary Superintendents, one of whom is in charge of the Sanitation Store for the Territory.

One Goanese Sanitary Inspector.

One Sub-Assistant Surgeon or Compounder in charge of the Infectious Diseases Hospital, who also assists in Port Health work.

TANGA.

One Medical Officer of Health.

Two European Sanitary Superintendents, one of whom is responsible for the sanitation of the Tanga-Moshi railway, when no Railway Sanitary Inspector is available.

TABORA.

One European Sanitary Superintendent.

KIGOMA AND UJIJI.

One Indian Sanitary Inspector.

MWANZA.

One Sanitary Inspector (a native of Seychelles).
One European Sanitary Superintendent is on leave.

NATIVE STAFF.

Twenty-four partially trained Native Sanitary Inspectors are employed throughout the Territory, of these nine are stationed in Dar-es-Salaam and assist in the work there and at the same time attend a further course of training. Four are stationed at Tanga, leaving eleven for the rest of the Territory. More will be trained when candidates come forward, but at present it is difficult to engage intelligent educated boys who can be trained into efficient Native Sanitary Inspectors. £12,000 was allocated during the financial year 1922-23 for sanitary labour, and this is divided between the Townships throughout the Territory.

Administrative Officers are invariably most anxious to improve the general health and well-being of the population of their districts, but the keenest cannot be expected to recognise obscure infectious diseases. It is in the investigation of outbreaks of infectious diseases that the greatest difficulty arises. The present staff, both medical and sanitary, are tied to the towns, nobody can be spared to go out at a moment's notice to investigate any suspicious outbreak reported. Distances are so great and roads so poor in the Territory that it frequently takes many days to reach the affected area. Young energetic Medical Officers should be available who can proceed immediately to any outbreak, so that reliable information can be obtained and the necessary measures initiated with a minimum of delay. Four additional Medical Officers are necessary, one to act as Medical Officer of Health of Tabora, a Township with 25,000 inhabitants situated in the centre of a district, the population of which is over 500,000. A second is required in the Victoria Nyanza area with headquarters at Mwanza, where plague and trypanosomiasis are constant dangers. Little definite information is available as to the conditions in the South Western area. Leprosy and yaws are common, while Dr. Eckard stated in 1913, before the Imperial Health Council at Berlin, that 3,303 cases of trypanosomiasis were known to exist on the shores of Lake Tanganyika. None are reported now, but portions of the area are fly-infested and the district should be investigated by a competent observer. The fourth should be stationed at Dar-es-Salaam as Assistant Medical Officer of Health, and could be fully employed along the cost and in the districts bordering on the Central Railway.

VITAL STATISTICS AND INFANT MORTALITY.

The 1921 census figures were discussed in last year's Report, and no further information is available. Native births and deaths are not registered, nor is registration compulsory for Asiatic births. Infant mortality is undoubtedly high, but reliable figures are not obtainable. Efforts were made in some districts to get the necessary information, but the results vary widely. Tanga reported an infantile death-rate of 134 per 1,000, while the table below was compiled by the Senior Commissioner of the Tabora district and is probably the most correct obtainable.

District.	Number of children born.	Number died.	Number still living.	Mortality.
				%
N.W. Kahama	4,125	1,934	2,194	47
,, Runsewe ...	3,489	2,056	1,430	59
South Ugunda and Ngulu	447	295	152	66
*East Igalula	254	116	138	45
*Children of Sultan ...	41	19	22	46
*N.E. Shinyanga ...	520	271	249	52
*Ushietu	715	295	420	41
*Nyawa	177	92	85	51
	9,768	5,078	4,690	52

* Cattle Areas.

The districts are taken at random in the Tabora area.

In view of the tendency to attribute the high infantile mortality throughout tropical Africa to venereal disease, these figures are specially interesting, as the Senior Medical Officer of the district states in his report that he is of opinion that venereal disease is not common in his district. He bases this opinion on the examination of hundreds of recruits and labourers. Venereal disease in some districts, particularly in the Lake Victoria area, undoubtedly causes a very large number of abortions and still-births, but other factors must have a great influence on the infantile mortality throughout the Territory. The partial immunity against malaria, tick fever and other indigenous diseases acquired by native communities is possibly obtained at the cost of a considerable number of lives. In most districts there are periods during each year when food is scarce and the unsuitable diet which is all that is then available, combined with helminthic infections, results in severe intestinal disorders.

An unclothed infant exposed to sun, rain and wide variations of temperature when the mother is at work cultivating her garden, has little chance of escaping a serious attack of respiratory disease, while small-pox and other infectious diseases also take their toll. A campaign against venereal disease would probably result in a marked increase in the number of births, but the percentage of deaths can only be reduced by the spread of education, especially amongst the female population. Suitable diet, clothing and in the case of serious illness a visit to a Government or Missionary Hospital before the resources of the local witch-doctor have been exhausted, would have the greatest influence in reducing the present high infant mortality rate throughout the Territory.

LEGAL.

The following ordinances and notices published during 1922 are of sanitary importance.

GINNERIES.

Government notice No. 232 laid down comprehensive rules for regulating the building and sanitation of ginneries, and was amplified by general notice No. 383, which laid down a satisfactory specification for rat-proofing buildings.

Government Notice No. 287, publishing rules made under the Cotton Ordinance of 1920, added powers of entrance and inspection of ginneries and cotton stores and allows a Medical Officer to prohibit storage and ginning until the premises are repaired or altered to his satisfaction. These rules if properly applied should enable the Sanitation Department to deal with any premises which are potential sources of plague infection.

TOWN PLANNING.

Government Notice No. 83 appointed Town Planning and Building Committees in each Township, and Government Notice No. 10 laid down Building Rules for Townships. The Rules in Part III. which refer to native buildings should be of great assistance in improving the condition of native residential areas.

Births and Deaths.

Ordinance No. 29 came into force on January 1st, 1923, and makes the registration of all non-native deaths compulsory. This is a small step in the right direction and should lead in time to the registration of all births and deaths throughout the Territory.

Township Rules.

A certain amount of confusion had arisen owing to Townships drawing up their own rules. A committee was appointed in January, 1922, to draw up Township rules for the Territory. These standard rules are now completed, and when published will take the place of the various rules adopted by different Townships.

CENTRAL TOWN PLANNING AND BUILDING COMMITTEE.

Thirteen meetings of this Committee were held during 1922. A memorandum on the principles of town planning was drawn up and published early in the year for the guidance of District Town Planning and Building Committees.

During the year the boundaries of many Townships were fixed and sites allotted for various Government buildings.

It was decided that the Central Lunatic Asylum should be built at Morogoro and a suitable site was selected.

EPIDEMIC DISEASES.

Plague.

No serious outbreak of plague has been reported during 1922. Cases have occurred throughout the year in the endemic area round Singida. The total number of cases known in this district is 30, of which five cases were not confirmed microscopically. Twenty-three deaths were reported, of which four were not confirmed microscopically; 93 cases were reported in 1920 and 149 in 1921. No cases occurred in the village, the nearest being two miles away. It appears likely that although the district will remain an endemic centre and a potential source of danger, yet the measures instituted should prevent the occurrence of a serious outbreak.

A most instructive outbreak of a disease which was almost certainly bubonic plague broke out in March, 1922, in the sub-district of Shinyanga. A man from the village of Mehama visited during February the endemic area on the Singida boundary. He returned in March and fell sick at once with high fever and severe headache, he developed a bubo in the axilla, and died two days afterwards. Within a fortnight 13 individuals died all with the same signs and symptoms as the first case—buboes, fever and death. Large numbers of rats died in the village during this period. The outbreak was promptly reported to the authorities and energetic measures were immediately taken. The village was burnt and the inhabitants quarantined under a police guard, all were doubly inoculated and rat destruction on a large scale instituted. These measures were entirely successful, no further deaths took place and none have been notified during the remainder of the year. The complete suppression of this outbreak is an example of the advantages of an adequate administrative and medical staff. Had the disease started in an area remote from an administrative centre and medical aid, it is highly probable that an alarming epidemic would have been in full swing before any measures could have been instituted.

Suspicious outbreaks were reported from Ukerewe Island and the Mori Valley, both in the Lake Victoria area; on investigation neither appear to be due to plague, and native reports indicate that the disease was possibly anthrax.

A fairly comprehensive account of the history of plague in Tanganyika Territory was published in the Annual Medical Report for 1921. It appears probable that the only endemic areas at present within the Colony are situated round Singida and in the neighbourhood of Shirati.

Tanganyika, however, is exposed to infection from the endemic areas in Uganda and the Kavirondo district of Kenya, and to a much less degree from India and other endemic areas outside Africa. Infection from the latter is unlikely, as in the great majority of cases vessels call at Mombasa, Zanzibar or other ports before arriving in Tanganyika Territory.

The traffic between Mwanza, Kisumu and the Uganda ports is a constant source of danger. Although all steamers and dhows are inspected on arrival and every precaution taken, the shortness of the voyage enables a person who is in the incubation period of the disease to arrive in apparent good health. There is, moreover, the possibility of infected rats leaving the ship and infecting the rat population ashore.

Of the two known endemic areas within the Territory, Shirati is an isolated area with a comparatively small population, and an outbreak in this district would be unlikely to cause serious trouble.

Singida, on the contrary, is a menace to the towns on the Central Railway. Cases have been reported within 40 miles of the railway and the possibility of infection being carried to Tabora and other large towns is always present. The institution of a six days' quarantine period for intending railway passengers from this area has, so far, prevented this occurring.

The practice of storing grain, seed cotton and other rat attracting produce in shops and living rooms in the bazaars, which is at present universal throughout the Territory, attracts a large rat population into the towns. The application of the new Township Rules, which prohibit the storage of rat attracting articles within the townships except in rat-proof godowns or bins, together with systematic trapping and poisoning, should bring about a great reduction in the rat population and so minimise the risk of a serious outbreak of plague.

Small-Pox.

Although small-pox is still widely distributed throughout the Territory, there was a marked diminution in the number of cases reported during 1922—832 cases were reported in 1920, 1,267 in 1921, and 390 in 1922; 150 of these cases were reported from native sources from one district near the Rufiji river; none of these cases was treated, and as only two deaths occurred it seems probable that the outbreak was not small-pox, but a severe form of chicken-pox. If this surmise is correct the total for 1922 becomes 240. Sixty-nine cases with 14 deaths were treated in hospital.

Small-pox occurred in 14 areas during the year. The southern area composed of the districts of Iringa, Mahenge and Songea being the only one from which no cases were reported.

In the outlying villages in Tabora district 49 cases with nine deaths occurred. These were distributed throughout 24 localities, an average of only two cases for each outbreak. The fact that these scattered cases did not start an epidemic would appear to prove that the protection produced by vaccination with Dar-es-Salaam lymph is very satisfactory.

Cerebro-Spinal Meningitis.

No serious outbreak of this disease occurred during 1922. The same number of cases were reported as in 1921, viz., 12. Nine of the cases died.

Typhus.

One European Police Officer stationed at Arusha was attacked with typhus in January and recovered after an illness of 33 days. There were no further cases of the disease during the year nor had it been previously reported in the district.

MALTA FEVER.

One native admitted to Arusha hospital as a case of pyrexia of uncertain origin was eventually diagnosed as Malta fever. The report from the Director of the Laboratory confirmed the diagnosis.

ANKYLOSTOMIASIS.

Ankylostomiasis is responsible for a considerable mortality in the Tanga district. In this area the native reports attribute slightly more than 20 per cent. of the total deaths to the effects of this disease. 1,991 cases with 43 deaths were treated in Government hospitals throughout the year; of these, 1,556 patients of whom 20 died attended Tanga Hospital. It is impossible at present to undertake mass treatment throughout this area. Pamphlets in Kiswahili explaining how the disease is spread have been issued to the natives, and it is hoped that an improvement in village sanitation will result.

INFLUENZA.

With the exception of minor outbreaks the Territory was free from epidemic influenza during 1922; 2,142 cases of influenza with 15 deaths were treated in Government hospitals during the year. Slight epidemics at Dar-es-Salaam, Arusha, Morogoro and Iringa were reported, the total cases of epidemic influenza being 1,176 with 37 deaths. In March a small outbreak occurred amongst the Dutch settlers in the Meru district of Arusha, which resulted in two deaths out of the 18 cases reported.

BILHARZIA.

Very little information is available as to the incidence of Bilharzial infections throughout the Territory. Thirty-eight cases with one death were treated at the hospitals. Further investigations are needed, particularly in the southern area, where the Germans reported that the disease was common. The absence of the Director of the Laboratory on leave prevented any further investigation as to the local carrier at Dar-es-Salaam. The Medical Officer, Dodoma, treated cases with rectal and vesical injections of tartarated antimony. His report is included as Appendix 7. (See page 92.)

DYSENTERY.

Dysentery is widely distributed throughout the Territory, practically every station reported cases. The total was 369 with 18 deaths, compared with 497 with seven deaths during 1921. Fifty Europeans contracted the disease, of which 29 were Government officials; no deaths occurred amongst Europeans. In the majority of cases no details as to the causative organism are available. Tabora and Arusha, with a total of 41 cases, state that all were amœbic dysentery.

A circular has been sent to all stations pointing out the necessity for a correct diagnosis in all cases of the disease, in this circular is embodied a memorandum by the Director of Laboratories which should be of great assistance to subordinate members of the Medical Department when making a differential diagnosis between the various forms of dysentery.

Hepatic Abscess.

Six cases of hepatic abscess with one death were reported during 1922.

Enteric Group.

Eighteen cases of the enteric group were reported during the year; fourteen of these cases on clinical evidence alone. The figures for 1920 and 1921 were fourteen and seven respectively.

Two deaths occurred, one native patient at Lindi and a Goanese lady at Dar-es-Salaam.

Six Europeans contracted typhoid and one paratyphoid B., the latter diagnosis being confirmed by the Laboratory.

Of the remaining eleven cases four occurred in one Goanese family at Dar-es-Salaam. The Medical Officer of Health was unable to trace the source of infection. Two cases were admitted to hospital at Tabora from the native ranks of the K.A.R. stationed there. The wells were closed and a stand-pipe provided; no further cases occurred.

Malaria.

The Senior Sanitation Officer and the Director of the Laboratory discussed the question of malaria fully in their annual reports for 1921. Few useful statistics can be produced from the figures showing the number of patients diagnosed as malaria who have attended various Government hospitals during 1922. The fact that the number of members of the native general population who were treated for malaria at the Sewa Hadji Hospital, Dar-es-Salaam, during 1922, was more than double the number of 1921 merely shows that the hospital is becoming more popular and proves nothing as to the number of cases amongst natives which occurred in the town. The figures for European cases in Dar-es-Salaam were 238 for 1921, and 170 for 1922, a reduction of nearly 30 per cent. This, with an European population of 550, half of whom are officials, does show that there was a diminished malarial incidence during 1922. In the smaller stations even the figures for the European population are of little value. The majority of Europeans who have resided in Africa for some years consider themselves quite capable to treat malaria. A settler or planter living some distance from the town would rarely call in a doctor to treat an uncomplicated attack of malaria.

In the sanitation section of the Annual Report for 1921, Table V., opposite page 106, shows the malaria sickness rate per 1,000 (Europeans by stations). Owing to the small number of Europeans who reside in some stations, it appears probable that a clearer idea of the relative incidence of malaria would be obtained by grouping stations with similar climatic conditions into areas. This has been done in the present report, and the malarial sickness rates per 1,000 are given in the following table :—

Districts.	*Area.*	*Sick Rate per* 1,000.
Moshi Arusha	Kilimanjaro	120
Bukoba Mwanza	Lake Victoria	170
Tukuyu Iringa Songea Namanyere	South Western	313
Morogoro Dodoma Tabora Kigoma	Central Railway	330
Tanga Pangani Bagamoyo Kilwa Lindi Dar-es-Salaam	Coastal	332

The figures for the south-western area require comment as the malarial incidence appears to be far too high in comparison with the Coastal and Central Railway areas. The probable explanation lies in the fact that although the stations themselves are comparatively healthy, yet the officials stationed in this area have to tour the surrounding districts, which are in many cases low lying and highly malarious.

BLACKWATER FEVER.

Forty-seven cases of blackwater fever were reported during 1922, as compared with 42 cases with seven deaths during 1921. The areas affected and the number of cases are given below :—

Kilimanjaro	4
Lake Victoria	2
South Western	4
Central Railway	16
Coastal	21

Of the four deaths recorded two occurred in the Central Railway area and two on the coast. Twenty-five Europeans suffered from the disease, of whom 17 were officials and eight non-officials; one official and two non-officials died.

Dar-es-Salaam had the greatest number of cases, 16 being treated in hospital, 11 were residents in the town, the remaining five being sent in for hospital treatment.

Four of the Dar-es-Salaam cases occurred amongst the K.A.R. stationed there; two British officers and two native soldiers being affected. The majority of the two cases presented no abnormal characters, but the following notes of interest are extracted from the reports of the Medical Officers concerned.

Tanga.—European Case. Developed malaria. Benign tertian parasites present.

Two days later blackwater fever; after two days the urine cleared, but the patient died suddenly that night from heart failure.

Tabora.—Goan Case. Temperature on admission 106·7. Recovery.

Indian boy. This case had five relapses, three after the administration of calcium chloride. Recovery.

European Hospital, Dar-es-Salaam.—European Case. Admitted unconscious and died of hyperpyrexia three days afterwards. Subtertian parasites were constantly present ranging from very numerous on admission to very few just before death, and this in spite of 45 grains of quinine given intramuscularly and intravenously. The urine, however, was clear before death.

TUBERCULOSIS.

During the year 206 cases with 23 deaths were treated in Government hospitals, as compared with 202 cases with 34 deaths during 1921.

Seven of these cases were Europeans, of which one was an official. This officer was invalided out of the service and has since died. No other European deaths occurred. Approximately 25 per cent. of the cases were reported from the Kilimanjaro area, the total treated at Moshi hospital being 51, of which one was an European. There were four deaths amongst non-Europeans. In 1921 the figures for Moshi were 64 cases with six deaths. Dar-es-Salaam shows the next highest incidence; 42 cases with six deaths were treated at the hospitals, as compared with 43 and 11 deaths in 1921.

Tuberculosis will be declared a notifiable disease at an early date. No immediate improvement, however, can be expected. A great deal of educational work will have to be done before the native, and still more the poorer class of Asiatic, will consent to give up his preference for living in dark, badly ventilated and often overcrowded houses.

YAWS.

Three thousand one hundred and twenty-three cases with six deaths were treated in Government hospitals during the year. From the statements in the Annual Reports from the various districts it appears that this disease is very unequally distributed throughout the Territory. The shores of Lake Tanganyika and the south-western area of the Territory seem to be the part most heavily infected. At Kigoma, the lake terminus of the Central Railway, 26 per cent. of the in-patients suffered from yaws. In Ufipa district, also bordering on Lake Tanganyika, it is stated that "Yaws is the commonest disease on the lake shore and in the Rukwa plain." At the headquarters of the neighbouring district of Rungwe 799 cases were treated, while Songea, the remaining district of the south-western area, reports that "Yaws cases are plentiful, but easily amenable to treatment."

On the other hand at Tabora, the largest native Township in the country, only 46 cases attended the hospital, though the Senior Medical Officer adds a rider to the effect that he has no information as to the prevalence of the disease in the out districts. Mwanza on Lake Victoria, also a considerable Township, had only 27 attendances.

The disease is prevalent in the north-eastern area. The small hospital at Kondoa-Irangi treated 728 cases, while at Moshi at the foot of Kilimanjoro, yaws cases are reported to be exceedingly plentiful.

Treatment.—A separate report on the treatment of yaws by bismuth sodium potassium tartrate will be found on page 82. When salvarsan substitutes have been available, excellent results have been obtained, except in the case of one patient who was the only European who contracted the disease. In this patient in spite of four injections of neokharsivan, a small yaw tubercle subsequently appeared inside the left nostril.

This widespread disease, disfiguring, painful and with sequelæ, which cause considerable reduction in the earning capacity of the patient, yet which can apparently be cured in a few days at a cost of 10s. for each patient, would appear to present an ideal field for an intensive campaign. If 20 per cent. of those infected with yaws presented themselves for treatment at Government hospitals during 1922 (this estimate is probably much too high), the total number of cases in the Territory is approximately 15,000. If one gramme of salvarsan substitute was available for each of these, the number could be so reduced that in a year or two a case of yaws would be a rarity.

LEPROSY.

The problem of the effective segregation and adequate treatment of lepers is no nearer solution. There are at present approximately 5,000 known lepers in the Territory; certainly 1,000 unknown lepers is a minimum estimate, which would probably be greatly exceeded if a thorough examination of the native population could be undertaken. These 5,000 lepers are at present congregated in camps scattered over the Territory. A sum of £4,400 being handed over to the Administrative Officers of the various districts to purchase food to supplement the supply grown by the lepers themselves and for the general upkeep of the camps.

With the present medical staff adequate treatment and supervision of these scattered camps is impossible. To collect 6,000 lepers into 12 large settlements, with an average population of 500, would cost a large sum of money.

Fertile land would have to be obtained near district headquarters where a Medical Officer is stationed, camps built and gardens prepared and planted. The cost of this and the purchase of clothes and blankets, provision of drugs and dressings, payment of medical attendants and the necessary guards would require a far larger sum of money than can be provided in the present financial condition of the Territory. No specific remedy for leprosy is known, treatment with preparations of chaulmoogra oil must be continued over a period of two years at least, improvement is slow and the results do not impress the African Native. Few natives will submit to injections unless the results are rapid and obvious. Injections of salvarsan and its substitutes are popular for yaws and secondary syphilis because improvement is immediate, but the introduction on a large scale of intramuscular injections for leprosy might have disastrous results. Segregation is really voluntary in the Territory; any patient who wishes to escape can almost certainly do so, and wholesale treatment by injection, even when given by an European Medical Officer, might result in the desertion of a large number of patients. A beginning, however, will be made during 1923; the Dar-es-Salaam leper settlement will be taken over by the Sanitation Department and the Medical Officer of Health; Dar-es-Salaam will be responsible for the administration of the camp; systematic antileprotic treatment will be carried out as far as possible. If this experiment is successful it will be extended next year to other districts where the leper settlements are within easy reach of the District Medical Officer's headquarters.

It is hoped by gradual extension on these lines that without the expenditure of any large sum of money all leper patients will in time receive adequate medical treatment.

When leper settlements are situated in the vicinity of mission stations every assistance is given by the various societies in supervising the proper administration of the camps. The lepers in the Lundu settlement on Lake Nyasa have been under the care of members of the Universities Mission to Central Africa. An average of 60 cases a week have been treated with intramuscular injections of "Moogral." Dr. Wigan reports that although it is too early to make any definite statement, yet the results are encouraging. The experimental course of treatment with the Ethyl Esters of chaulmoogra oil commenced at Dar-es-Salaam in 1921, and described in the Annual Report for that year was continued during 1922. A separate report by the Director of the Laboratory will be found in Appendix .

VENEREAL DISEASE.

Two thousand one hundred and forty-five cases of syphilis and 1,198 of gonorrhœa were treated in Government hospitals during 1922; the figures for 1921 were 2,446 and 1,219 respectively.

Approximately 40 per cent. of the syphilitics and 25 per cent. of the gonorrhœa cases were admitted as in-patients. One-third of the total number were reported from the Victoria Nyanza area, and were treated at Bukoba and Mwanza hospitals. Separate reports from the Medical Officers at these stations are appended.

The Principal Medical Officer has included in his report a statement as to the present position throughout the Territory and has outlined the measures which will be necessary to initiate an anti-venereal campaign in the Bukoba district.

VENEREAL DISEASES.

Bukoba District.

Report by Dr. G. A. Williams, Medical Officer, Bukoba.

Syphilis.—The numbers shown in the returns do not by any means represent the widespread havoc of this disease. The number 440 represents the patients who came to Bukoba Hospital for syphilis pure and simple, and does not include those who came for other complaints and are found to be syphilitic, nor do they include patients met while on tour in the district, or patients treated at the different missions.

The percentage of syphilitics in Bukoba and district is exceedingly high, and is placed by some as high as 80 to 90 per cent. From my experience I am inclined to accept these figures, and I regard the treatment of venereal diseases here as far the most important work to be carried out.

We have had some very striking results; some of these cases have been noised abroad and we have now plenty of patients anxious for treatment, and I propose to devote a good deal of time in future to the treatment of such cases.

The usual remedies are used. Neokharsivan we give by injection into the buttocks, and we have had no untoward results, while the curative effects have been eminently satisfactory. Natives have unbounded belief in the "dawa ya sindano," and are most eager to be injected.

Gonorrhœa.—This disease is confounded with syphilis by the natives and many patients think that a purulent discharge is ample evidence of syphilis. Gonorrhœa is widespread, and it seems well nigh impossible to impress upon the native the seriousness of the disease. Great trust is placed in native medicines, and only a small number unfortunately come to the hospital while in the acute stage, and then they give up coming soon after. Consequently we have most distressing complications arising.

Time after time we have cases such as I have never seen *before* in a fairly wide experience. A patient is carried to hospital probably from a distance, suffering from strictures and multiple fistulæ, penis and scrotum enlarged, with thick hard infiltrated tissues, and fistulæ of penis, scrotum and perinium. All discharging urine and pus and altogether in a filthy stinking state and the patient much emaciated. In such a case all we have been able to do is to slit up the prepuce to get at the meatus, then do the best we could by dilatation of strictures, following by lavage if possible, at the same time cleaning up things generally by opening up pus pockets and occasionally scraping fistulæ. In some cases this has brought about marked improvement, but in the majority of cases very little could be done.

I have had some valuable suggestions for treatment of such cases from Dr. Ernest Cook, of Kampala, and when our operating theatre is completed I hope to benefit by his experience and advice. Another distressing sequel which we see far too often is extravasation of urine. Four only reached hospital, while others have died on the way. Two of these cases we were successful in saving, while the other two died. I understand such cases are fairly common in the district, and I am glad to report there is now an increasing tendency on the part of the native authorities to have patients sent to the hospital as soon as urination becomes difficult.

Mwanza District.

Report by Dr. G. Maclean, Medical Officer, Mwanza.

The relative frequency of gonorrhœa and syphilis has not yet been ascertained. They must, therefore, be treated as one class of diseases.

In certain parts of the district this class of diseases is rife. With the possible exceptions of Ssima and Magu, where the conditions appear to be a little better, at least 50 per cent. of the population between Smith Sound and the Ssimiyu River may be taken as having had one or other of these diseases either inherited or acquired.

The Sultan of Usmao and the Regent of Sengerma have estimated, independently, that 90 per cent. of their people suffer from the disease, some time or other in their lives. This is possibly an over-estimate.

European estimates for Usmao are: for acquired syphilis 50 per cent., and for inherited and acquired at least 70 per cent.; for Nera, venereal disease, for the most part syphilis, at least 70 per cent.

The above area is occupied by Wasukuma tribes.

The Sultan of Ukerewe estimates that in his district 70 per cent. of the people have had the disease. The Sultanate is occupied by the Wakerewe, a tribe allied to the Wazinza and to the Bukoba tribes.

Uzinza is said to be affected to at least as bad a degree as Ukerewe.

Among the eastern Wasukuma there is comparatively little venereal disease. In Musoma district, *i.e.*, north of the Ruvana River, there is also said to be very little, except near Musoma itself, where it appears to be gaining a footing.

Factors in the Spread of the Disease.

An important general factor was the upheaval caused by the late war. How far this has been responsible for establishing a more degraded moral standard I am unable to say, but there is no doubt it was responsible for a large number of venereal cases.

There is a large prostitute population in Mwanza town and in the other smaller trading centres. A large proportion (perhaps the majority) of these are from Bukoba district. Apart from these there are certain permanent factors peculiar to the different tribes. These are :—

(1) Among the Eastern Wasukuma.

(*a*) Certain customs favour spread. There is a long standing custom of having in each village two large single-roomed houses, one for boys and one for girls. The alleged origin of this custom is the fact that most native houses are single-roomed, and that parents object to sharing it with their children after these have attained to a certain age. The girls' house or madji, as it is called (which may accommodate as many as 50 girls), has become the favourite night haunt of youths and adult men alike with inevitable results.

An accessory to these madjis is the practice of night dances which are very popular among these people. By most girls it is regarded as a favour to receive advances from a professional dancer, who generally suffers from venereal disease.

(*a*) The trader, particularly the Swahili trader, is generally blamed for spreading the disease. This does not necessarily mean that his morals are lower, but the fact that he is more of a traveller increases his chance of being infected. In recent times, native girls, lured by the desire for more elaborate dress and ornaments, visit the trading centres, become temporary inmates of the traders' homes and then return, as one informant puts it, "with the dress and the disease." The mischief does not, of course, end with this; it appears that most girls, having once broken through their reserve, readily lend themselves for a little money, so that, as far as one is able to ascertain, the conditions of affairs, among unmarried women and girls, at trading centres at least, is little better than general prostitution.

In Ukerewe, madjis do not exist, but what opportunity is wanting in this respect is partly made up for by the irresponsible character of the people, who at the present day at least, appear to be almost altogether lacking in appreciation of domestic virtue. It is stated by intelligent natives that a deterioration of family life has occurred since the advent of the Swahili trader.

What part night dances play in the spread of the disease in this district I am unable to say. It has been suggested that the diversion of the tribe from warlike pursuits has reacted detrimentally on their character, but in a country where tradition even is short lived, it is difficult to get any sound information on this point.

Uzinza has not yet been visited by me, and medical information about it is rather fragmentary. The people appear to resemble in character their kindred in Ukerewe. It is said that the customs of "Blood Brotherhood," which is also practised in Ukerewe, has here degenerated from merely conferring general rights to permitting undue intimacy in domestic relations. It is obvious that this opens a wide avenue for the spread of the disease.

That this intimacy is of degraded form, and not an integral part of Blood Brotherhood, would appear probable from the fact that it is not practised in the closely allied tribes of Ukerewe and Msala. I have not been able to get any information as to the history of this custom or the factors that have given rise to it.

Factors Operating where there has been no Serious Spread.

(1) Among the eastern Wasukuma there are three alleged reasons.

(*a*) Paucity of trade centres. (*b*) Absence of madjis. (*c*) Absence of night dances—the dances here usually finishing about sundown. It is a fact that family life is more stable among these people than among their eastern kinsmen, and there can be little doubt that absence of the above three factors does away with a great temptation to loosen the family bonds. In this connection it is interesting to note that in the east of Itilima, where the people follow the eastern customs, there is very little disease, while on the western side of the same sultanate, only twenty miles away, it is present on a large scale.

(2) Among the Tribes north of the Ruvana.

Trade has hitherto made little progress except in the vicinity of Shirati and Musoma, and the spread of the disease has been correspondingly restricted. When it first began to appear around Musoma the natives had a wholesome dread of it, and it is said that anybody found suffering from it was practically ostracised, temporarily at least, detection being then comparatively easy on account of the almost nude condition of the men. (With the gradual introduction of more elaborate dress this element of safety is gradually disappearing.)

Among the Washasi, and probably among other allied tribes as well, girls are said to be jealously guarded until they are circumcised at puberty.

Of the stability of family relations among the northern tribes generally, I am not able to give any information.

Effect of Venereal Disease on Tax.

So far as one can see there is generally no immediate effect, the patient being usually able to pay his tax, if an adult, for the year in which he is infected. The ultimate effect, in shortening individual lives and in decreasing the birth-rate, cannot be gauged with any accuracy at present, but they must be considerable.

Effect on the Tribe as Units.

One hears of numerous instances of abortions, still-births, and deaths of infants attributed to venereal diseases, but it is impossible to get statistics covering a sufficient length of time to show the effect either on physique or on population. So far as one's information goes it suggests that the three western tribes mentioned, are in some danger of gradual extinction. In any case there can be no doubt that it is the most important medical problem of the district at present, and that an early attempt must be made to get fuller information about the whole problem.

Effect of Native Treatment.

Certain modes of treatment appear to be sufficiently successful, at least so far as primary symptoms are concerned, as to justify investigations. Success is also claimed for various anti-syphilitic treatments, but judging from the number of ulcers one sees in people who have been "cured" by native drugs, it must be conceded that these treatments are at best defective.

Prophylaxis.

It is evident, even from the incomplete information given above, that the problem is as much socialogical as medicinal.

The undoubted fact that degeneration has occurred in the customs of the people (*e.g.*, with regard to solicitations) suggests that the necessity of a reconstruction of these, but this should await a more minute inquiry into the habits of the natives.

It may be mentioned at this instance that in a few isolated cases villages have become alive to the evil effects of madjis, and follow the customs of the western Wasukuma. Such cases have been reported from Usmao.

With regard to medicinal remedies, much more could be done in the town with a larger supply of drugs. Natives fully realise the benefits of neokharsivan injections, and with an adequate supply the majority of syphilitic cases would, I think, voluntarily present themselves for treatment. These could be rendered non-infective, while a minority could be given curative mercurial treatment.

The treatment of gonorrhœa would be more difficult to control. Native treatment seems fairly effective in clearing up the acute stage, at least in men, while it is probably less effective in women. It seems extremely likely that untreated or partially treated women are the main reservoir of this disease, and it is not to be expected that anything short of compulsory treatment will eradicate the infection in these, except, of course, after long periods of time.

Any attempt to overcome the disease in the town must be accompanied by powers to inspect and treat persons arriving from other districts. It is well known that regular prostitutes, to say nothing of other infected native passengers, travel from port to port. These cannot at present be put under any medical control.

Prevention of Spread to the Non-infected Districts.

This, too, requires a minute enquiry before a rigid policy can be decided upon. There are certain points, however, that seem to be obvious.

Traders in these districts should be submitted to periodical medical examinations, and a clean bill of health made as important as a trading licence. Legal precautions should be enforced against the luring of young girls by traders and other temporary residents.*

Sultans and headmen should be encouraged (by rewards if necessary) to send suspected persons for treatment. This should present no great difficulty to headmen when once they realise the importance of the matter, as, generally speaking, the only persons open in the first instance to suspicion would be those returned from trading centres.

Every facility should be given in these districts for treatment, and this is one important reason why an experienced and reliable Sub-Assistant Surgeon should be stationed in Musoma.

An attempt will be made in the coming year to institute treatment at Nassa and adjacent trade centres as a safeguard against undue spread among the eastern Wasukuma.

HUMAN TRYPANOSOMIASIS IN THE MWANZI AREA OF TANGANYIKA TERRITORY.

At the latter end of March, 1922, the Medical Officer, Mwanza, reported an outbreak of sleeping sickness in the Ntussu sultanate, situated about 50 miles east of Mwanza, in a district where G. palpalis is rare, but in which large areas are infested with tsetse of the morsitans group. 70 deaths were reported by the chiefs and a medical examination of 25 sick persons showed that trypanosomes were present in 12 cases, the diagnosis was confirmed by the Director of the Laboratory, to whom slides were sent.

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* Certain powers exist under the Young Girls' Protection Ordinance, 1921.

The possibility of the outbreak being due to T. rhodesiense and not to T. gambiense was at once realised by Dr. Shircore, the Acting Principal Medical Officer, although the Rhodesian form of sleeping sickness had not been found previously north of latitude 9° S., while Mwanza is situated about latitude 2° 50′ S. Between these latitudes vast areas of the western half of Tanganyika Territory are infested with tsetse of the morsitans group, and the seriousness of the position was apparent from the first.

Fortunately, the infected fly belt is a comparatively small one as distances go in Africa, being about 150 miles long by 100 miles wide, moreover, it is separated from the great western tsetse fly area by a fly-free belt nearly fifty miles wide.

Energetic measures were immediately taken to prevent the main tsetse area becoming infected.

The patients and suspects were collected in hospitals situated in fly-free areas and the other natives removed from the infected districts. Patients were given Soamin gr. XII. in order to remove the trypanosomes from the peripheral blood. Clearing of the bush round villages and along roads was vigorously carried out, 1,000 axes and 1,000 hatchets being supplied by this Department for the purpose to supplement the inadequate tools possessed by the local natives. The Senior Commissioner, Mwanza, took most energetic measures to prevent the spread of the epidemic. The instructions he issued were as follows :—

(1) Natives residing in tsetse forest or exposed areas in the Sengerema, Usmao, Itilima, Nunghu, Ntussu, Nassa and Ututwa sultanates will be removed to open cleared tracts in their sultanate as soon as their crops are harvested.

(2) Natives so evacuated will be prohibited from settling in a different sultanate or under a different headman.

(3) No new village or garden must be established within half a mile of forest; and all bush round existing villages and gardens in open spaces less than half a mile from forest must be cleared so as to maintain as open cleared belt of half a mile between such village or garden and the forest.

(4) Natives other than Government employees on duty are prohibited from entering tsetse forest for any purpose other than essential travelling along a main road authorised for such movement or for clearing operations ordered by the Government.

(5) Natives are prohibited from entering tsetse forest along the Simiyu and Duma rivers for fishing.

(6) Natives in the main infected area and natives moving east and west must proceed by specified routes.

The tsetse forest stretches of these routes are to be cleared of all bush and trees to a width of 100 yards on each side of the road.

Government will supply to Sultans the necessary axes and hatchets for the cutting down of the larger trees, for which work native implements are quite inadequate.

(7) Natives when called on by their Sultans and headmen in compliance with the Senior Commissioner's order must assist in clearing operations.

(8) Euphorbia hedges around villages near forest must be kept pruned to a maximum height of 5 feet.

(9) Bush fires are prohibited until the Government issues orders to Sultans and headmen appointing a date and the action necessary.

But the custom of stock-owning natives to burn a protective fire belt around pastures will not be interfered with, provided that it is carried out under the superintendence of the village headman.

Natives, when so ordered by a Sultan or headman, are bound to turn out to extinguish an unauthorised bush fire.

(10) In cases where stock has to be taken through tsetse forest to water, a belt 100 yards in width must be cleared along such path.

(11) Cases of suspected sleeping sickness must be reported at once by the owner or occupant of the hut concerned to the village headman and by him to the Sultans, who will then report to the nearest Administrative Officer.

Such cases must also be reported at once to any official of the Medical Department visiting the village and all sick must be produced to him. Concealment of cases or of sick persons will be a punishable offence.

(12) Natives residing in infested or tsetse areas are prohibited from travelling (*a*) southwards to Tabora district or elsewhere; (*b*) to tsetse areas south or east or Smith Sound; (*c*) to the Ushashi Ikoma and other areas in Musoma sub-district.

(13) Every possible means will be taken to educate natives as to the reasons for and objects of the measures. Missionaries are being asked to co-operate. An active policy of educational propaganda is necessary in the hope of reducing acts of obstruction and disobedience to a minimum.

(14) Cattle must not be moved from infected areas except to cleared spaces in the same Sultanate.

(15) Natives in the Sultanates concerned other than those to be evacuated will be required to turn out and work gratis for a period of not more than two months in clearing the routes referred to in (6) above.

Mr. Swynnerton, the Game Warden, investigated the area early in May and prepared a most valuable report, mapping out the fly areas. He found that the prevalent tsetse was of the morsitans group, but did not correspond exactly with any known variety. He took specimens to England for further examination, and his opinion that the tsetse, which is the vector in this outbreak, had not been described previously has been confirmed by the entomological experts in England. His paper was published in the Bulletin of Entomological Research, Vol. XIII., part 3.

The Governor of the Uganda Protectorate was asked if the services of Dr. H. Lyndhurst Duke could be made available for the purpose of proceeding to the locality concerned and conducting the necessary investigations. Dr. Duke arrived at Mwanza on July 11th; 187 deaths had been reported up to that date (probably many more had not been reported), while 84 suspected cases of sleeping sickness had been collected in four Camps.

Dr. Duke investigated the outbreak and returned on Mwanza on August 21st. His valuable report was received on October 16th and will be found in the proceedings of the Royal Society, 1923, January 4th Series, B Volume 94, pp. 250-265.

The Director of Imperial Diseases Bureau having suggested that G. palpalis would probably be found on the Simiju river and might be responsible for the outbreak of sleeping sickness in the district, a careful examination was made, but no G. palpalis were found.

Patients and contacts are concentrated in four camps: Kidabu, Dani, Lugulu and Nangi. Kidabu is the largest, and as it is the nearest to Mwanza, the majority of cases will be transferred there. Owing to shortage of staff it has not been possible to detail a Medical Officer to supervise these camps; the Medical Officer, Mwanza, leaves his station when he is able to do so and inspects the patients and directs the treatment.

Treatment so far has been experimental. Advanced cases have been Soamin Gr. XII. intramuscularly every ten days. Dr. Maclean reports that "decided improvement has taken place in some cases, one or two of which had been regarded as hopeless. There appears to be little doubt that the drug given in this way has a marked sterilising effect on the peripheral blood, but the results are not uniform."

Early cases received Tartar Emetic in doses of gr. 1 intravenously every third day until gr. VI. had been given, followed after a month's interval by 4½ grains of Soamin intramuscularly every third day. Dr. Maclean states that "no definite opinion can be given as to the results of this treatment, but the general condition of the patients remains good."

Sodium-Potassium-Bismuth-Tartrate locally made which had been used as an experimental treatment for yaws was tried without success, the report being, " a few cases treated, one died, another showed no improvement in his general health, while parasites remained in the peripheral blood after ten injections."

The position from the Medical side at the end of 1922 was reported by Dr. Maclean to be as follows :—

	Deaths.
Recorded by Chiefs	591
Recorded by Medical Staff	92
	683

Sleeping sickness cases remaining in hospital.	Suspects detained under observation.
31-12-22	31-12-22
18	15

Mr. Turnbull, the Senior Commissioner, Mwanza, in the course of a full report on the Administrative measures which had been put in force during 1922, puts forward his programme for 1923. Extracts from the last two sections of his report follow :—

Programme for the year 1923.

I am of opinion that the programme should be as follows, given no untoward change in the situation :—

(1) The continuance of the work of clearing tsetse forest along main roads and cutting it back where it is too close to native villages, the sites of which are in cleared areas.

(2) Medical inspection of the Mwagalla and Meatu sultanates and mapping of tsetse belts, and, where necessary, the evacuation of small scattered hamlets from tsetse forest to existing cleared areas; and also the cutting of the thorn forest along the Mwagalla-Meatu road, *i.e.*, between Mwamala and the Mwakidagembe stream, three-quarters of an hour's march from Kimali.

(3) The clearance of bush with road outlets at selected sites on the Duma and Simiyu rivers in various sultanates, so as to permit the natives to fish and water their cattle. This has been done in certain cases already).

(4) The maintenance of the clearing at the Ruwana ford and of that of the strip of tsetse forest between the Ruwana river and the foot of the Baridi hills. (This work has been carried out by the

administrative officer i/c Musoma in whose sub-district the localities lie).

(5) The continued observance of the simple rules drawn up for the benefit of the native community and the continued support of Sultans in allowing them to inflict small punishments on villagers who have contravened the rules. (This is essential and of first rate importance).

(6) The prohibition of new native settlements in tsetse forest in the Sultanates referred to in this report.

(7) The maintenance of the four sleeping sickness hospitals until such time as the Medical Officer advised their reduction.

(8) An inspection of the tsetse areas in Mjita, and continuance of clearing along the roads and around villages.

The occurrence of an epidemic of the Rhodesian form of sleeping sickness so far removed from any previously reported outbreak is a warning which cannot be disregarded. Had the outbreak occurred on the south-western side of Mwanza instead of to the eastward, it is impossible to say what the result would have been. The western fly belt as marked on the German maps is approximately 270 miles from north to south and 200 miles from east to west. Any serious outbreak in this enormous area might prove disastrous and the whole medical staff of the Territory would be hardly adequate to deal with sleeping sickness alone. Add to this the palpalis areas Lake Victoria, Nyanza, and Tanganyika, and the Ruvuma morsitans area, in all of which sleeping sickness was found by German observers, and the potential danger to the Territory is apparent.

It is true that Dr. Clark, while stationed at Lindi, toured the Ruvuma river area and found no sleeping sickness and that Dr. Vanderwert from Kassanga had the same experience on the southern end of Tanganyika, but neither observer had the time nor the necessary special training to make their reports conclusive.

No plea for economy can justify any delay in the appointment of at least two specially qualified Medical Officers who will devote their time largely to sleeping sickness, but who will also be available to investigate any outbreak of infectious disease reported in the district.

One should be responsible for the north-west area, and the other for the south-east and Ruvuma areas and also the south end of Lake Tanganyika.

The fact that the Mwanza outbreak occurred in an isolated fly belt and that the services of experts such as Dr. Duke and Mr. Swynnerton were available, also that officers so energetic as Mr. Turnbull, the Senior Commissioner, and Dr. Maclean, the Medical Officer, were on the spot, must not be taken as a precedent. The efficient Administrative measures enforced by the Senior Commissioner have been the main factor in the limitation of the outbreak, but on this occasion the odds were in our favour. Even in this district within easy reach of the largest station in the Lake Victoria area it is certain that many cases have been concealed from the authorities. Future outbreaks, if they occur in unisolated fly belts remote from an Administrative centre where the chiefs and natives will not be so amenable to discipline, may require the undivided attention of a considerable staff to ensure that the necessary administrative measures are properly carried out.

NOTE.—The map published in the Bulletin of Entomological Research, Vol. XIII., part 3, to illustrate Mr. Swynnerton's paper, gives much valuable information. Dr. Maclean's hospitals have been renamed in some cases; Duha, on the western edge of the fly belt should be called Kidabu, while the hospital shown near Maswa is now called Nangi. Lugulu retains its name, while Dani, not shown on the map, is situated near the initial N in Nunghu half-way between Kuru and Shamwa.

URBAN SANITATION.

BUKOBA.

EXTRACTS FROM A REPORT BY DR. G. A. WILLIAMS,
MEDICAL OFFICER, BUKOBA.

SANITATION.

(*a*). *Administrative.*

We have no European Sanitary Officer to help the Medical Officer and Sub-Assistant Surgeon.

The Native Staff conists of :—

Native Sanitary Inspector	1
Native Sanitary Labourers	22

These figures include those specially employed in removal of night soil.

Their work consists mainly in keeping clear the River Kanoni, clearing undergrowth, keeping a look-out for pools in the numerous rocks, where mosquitoes might breed, clearing bats and rats from houses, etc.

The staff is very small for the work, and I think they have done very good work under the circumstances, and it is due to their labours that mosquitoes and flies are not much in evidence.

Knowledge of hygiene and sanitation is spread by the Staff in their everyday work, and it has been possible to give lectures in elementary hygiene to the school pupils only.

We have fixed up three lots of public latrines, and these are now quite satisfactorily run and have brought about a great improvement in general sanitation.

Before the erection of these there was much trouble, but after their erection, thanks to the consistent support accorded by the Administrative Officers, some valuable lessons were given to offenders detected, with subsequent benefit to the public at large.

Mosquitoes.—Bukoba Town is comparatively free from mosquitoes, although about the time of the rains they will breed freely if given opportunity.

It is a well-known fact that the River Kanoni, and the waterways connected therewith do not seem to be favourable to mosquitoes.

During the year, I have made attempts to find out the enemy which is accountable for mosquito destruction.

I have found no difficulty in breeding Anopheles and Culex, including Stegomyia, in lake water, river water, swamp water, and rain water.

I have kept small fish, taken from the river, with the eggs and larvæ, but I have never seen them attempt to devour them.

Later, I hope to try larger river fish and also larvæ of the dragon fly, which fly is fairly common here.

Owing to the amount of opportunities for breeding afforded by pools, the numerous rocks about the place, and bamboo poles, etc., I think it reflects credit on the European population generally, and the Native Sanitary Inspector and his Native Staff, that the town is so comparatively free.

KIGOMA AND UJIJI.

Extracts from a Report by Dr. J. McK. Clark, Medical Officer, Kigoma.

Administration.

From the beginning of the year to the end of July the Sanitary Staff at Kigoma consisted of the following : One Indian Sanitary Inspector, three Headmen, one Mosquito Boy, and 60 Labourers; and one Native Sanitary Inspector, one Headman, and 25 Labourers for the Railway area. At the large native town of Ujiji there was one Native Sanitary Inspector with one Headman and 30 Labourers.

From the middle of the year on, these numbers were greatly reduced, and the following is now the staff :—

Kigoma proper.—One Indian Sanitary Inspector, one Mosquito Boy, two Headmen, and twenty Labourers.

Railway Area.—One Native Sanitary Inspector, one Headman, and twenty-five labourers.

Ujiji.—One Native Sanitary Inspector, one Headman, and eleven Labourers.

Work was mainly preventive in nature, viz., removal of night soil from the various public and private closets, collecting of rubbish from all parts of the township, grass cutting, sweeping of streets, attendance on incinerators.

Night soil.—Several buildings in the township, such as the Kaiserhof Hotel, Administrative building and Station, possess water-flushed closets. These flush into underground cesspits, and the system appears to be satisfactory, except that, owing to bad trapping of the pipes, smelling gases filter up from time to time through the closets and pervade the rooms. Frequent flushing is necessary to control this.

Many of the houses possessed cesspits in the earlier days, but as the water supply is drawn from the lake and it was feared that contamination might result, these were closed up one by one till there are now very few left, their place being taken by a dry bucket system with incineration. This would, no doubt, have been quite satisfactory but for the great reduction of staff which took place, the result being that individuals had to make their own arrangements for removing and emptying the buckets. This, of course, is far from being the ideal way, and it is hoped it may soon be possible for all night soil to be dealt with by the township itself, or by some other method, each individual paying so much towards the wages of the extra labour required.

Refuse disposal.—Practically all township rubbish is incinerated. There are eight incinerators of which four are fed from the main part of the town. One is situated in Rangwe village and two in Mwanza, a fair-sized village on the ridge behind the town. The eighth is placed near the K.A.R. lines and receives most of its rubbish from that area. All these incinerators are four square stone and mud erections with railway sleepers for bars, and incineration is poor, those in the main part of the town creating nearly as great a nuisance from smoke and smell as the good they do. They have all lost their protecting roofs and incineration has been particularly bad during the rains. Repairs are urgently needed, and the one close to the Standard Bank should be removed to another site as the Bank and Hotel suffer greatly from the smoke and smell from it.

Water Supply.—Kigoma water supply is drawn from Lake Tanganyika and is good. The water is pumped by a small pumping plant at the lake edge to two tanks behind the Kaiserhof Hotel, and a pipe supply is available at most of the houses. The supply has been calculated not to be sufficient for the needs of the town, and another scheme has been put forward.

Malaria.—In a total of 2,020 patients treated at the hospital, 397 were returned as malarial fever. Most of the cases occurred amongst "Native Officials," many of whom live at Ujiji or move up and down the railway. It is impossible, therefore, to say what proportion contracted the disease in Kigoma itself, even if first attacks could be distinguished from "relapses." Throughout the latter part of the year, however, *i.e.*, during the rains, many anopheline mosquitoes were noticed in such places as the Kaiserhof Hotels and certain bungalows. As native employees live for the most part at considerable distances from the residential parts of the town, it is possible that the percentage of infected mosquitoes is not very great.

Infectious Diseases.—Two cases of tuberculosis only are recorded in the hospital returns, one of which, an Indian, died.

Twenty-four cases of *gonorrhœa* received treatment, sixteen of which were "Native Officials," and eight non-official natives.

Of *syphilis* 68 cases were treated. Venereal disease is common.

Yaws is also a very prevalent malady and 141 cases came to the hospital for treatment. Two-thirds were drawn from the non-official class, many of the patients coming from far away in the district.

One case of leprosy was seen at the dispensary at Ujiji.

Epidemic Diseases.—In the month of September a small outbreak *of small-pox* occurred in the township. It originated in a case which had been removed from one of the lake steamships arriving from the Congo. This case, in the absence of a quarantine hospital, was isolated near the Native Hospital whence the infection spread till a total of fourteen cases with five deaths was reached.

Twelve natives, one Indian, and one European (the Medical Officer himself) were attacked. There was one hæmorrhagic case, several confluent, and the remainder discrete. One patient presented the appearance of chicken-pox rather than that of the more serious disease.

The whole of the township and its near surroundings has been well vaccinated during the year, but unfortunately no reliable figures can be provided as to the percentage of successes. Of 2,017 vaccinations performed during the small-pox outbreak, *i.e.*, from October to the end of December, 1,397 were seen again, of which 626 or about 45 per cent. were successful. Many of these vaccinations were performed on people desiring to travel by boat or train, and naturally these were not seen again.

MWANZA.

Extract from a Report by Dr. G. Maclean, Medical Officer, Mwanza.

Sanitary Arrangements.

Refuse from the European and Indian quarters, and from public latrines is incinerated. Arabs and Natives for the most part use cesspits.

Urine is disposed of in a large pit on the outskirts of the town.

Water supply.—Europeans, Asiatics, and the Natives, north and east of the town get it from a stream (usually dried up into mere pools in the dry season) and from adjacent water holes. Present conditions are unsatisfactory in the following respects :—

(1) *In the Town.*

Anti-mosquito Work.—A large number of pits, for the most part dating from the time of the German occupation, are still undrained or unfilled. A large part of the lake shore has still to be cleared.

A stream which runs through the town during the rains, is partially dried up during the dry season, becoming mere stagnant pools of water. Adjacent to it are water holes which do not seem worth interfering with until the question of rendering the stream safe is decided upon. At the mouth of the same stream is a stagnant pool, due to the fact that, except when the lake is low, the bed of the stream here is lower than the level of the lake. The Senior Commissioner has effected a considerable improvement here by diverting the channel of the stream. There is still, however, some stagnant water.

The pools remaining in the partially dried up stream in its upper part are the most important source of mosquitoes in the town during the dry season. The danger from this is increased by the fact that in the vicinity, ample shade is provided for mosquitoes in the foliage of numerous mango trees.

Measures relating to Epidemic Diseases.—With regards to these in general a quarantine camp is urgently required. At present there are no means whatever for controlling contacts.

Anti-plague.—While the cotton trade is rapidly increasing, there are no corresponding safeguards against plague. The go-downs of the present ginnery are not rat-proof, though cotton is being constantly ginned there at the present time. Cotton, too, is being stored in ordinary dukas and even in living rooms. (This seems to be done now on even a greater scale than was the case when the town was inspected by the Senior Sanitation Officer). The storage of hides is in much the same position as that of cotton. Should Plague gain a footing, it may be taken as very moderate estimate that 20 per cent. of the town population, or 800 persons, will succumb. The probability is that the rate will be much higher.

Progress made during the Year.

So far as the town of Mwanza is concerned this was impeded, first, because of the necessity of concentration on sleeping sickness, and again on account of the prolonged illness of the Sanitary Inspector. Some improvement has been effected in the clearing of the lake shore and in draining and filling in of pits and holes. In all these, the Administrate Department have considerably assisted.

An important step by the latter Department has been to remove Natives from the slopes that drain into the bay from which the main water supply is obtained. This at the same time leaves a section of the European quarter free from the danger of having Malaria-infected native children in the vicinity.

Educational.—Short accounts of the following diseases have been drawn up in Kiswahili and distributed to the more advanced Sultans and the native teachers :—Malaria, tick fever, filariasis, ankylostomiasis, beri-beri. This is being extended to plague, small-pox, cerebro-spinal meningitis. and sleeping sickness.

It will take several years before a satisfactory sanitary standard can be reached with the present staff. Once reached, the present strength would probably be ample to maintain it until the town grew. It is very important that a Sanitary Superintendent should be stationed at Mwanza until the arrears of anti-mosquito work is cleared off, and a satisfactory sanitary system established in the Native quarter.

The main difficulty at present is supervision of the work which requires, to get the best out of it, more vigilance than is possible for one medical officer to give.

The stream already mentioned should be drained, but this is essentially an engineering question, and estimates for the work can only be drawn up by an engineer.

Water supply is largely a question of convenience, though, obviously, it would be safer if it came from a pipe which ended some distance out in the lake, than when drawn by natives who have to wade out to get it.

The question will have to be reconsidered if the stream already mentioned is drained, as some of the houses on the south are one to one-and-a-half miles from the lake.

Sanitation of the Prison.—This is highly satisfactory. All parts of the prison—cells, workshops, kitchen, sanitary lines—are models of cleanliness and orderliness.

A considerable improvement has been effected this year in the ventilation of the cells. It will be interesting to see if this has any effect on the incidence and severity of pulmonery complaints in the rainy season.

Sanitation of the K.A.R. Camp.—With the exception of some pits and some low-lying ground in the vicinity of the camp, likely to breed mosquitoes in the rainy season, conditions are highly satisfactory.

TABORA.

EXTRACT OF A REPORT BY DR. C. L. IEVERS, SENIOR MEDICAL OFFICER, TABORA.

PREVENTATIVE MEASURES.

(*a*) *Town and Station.*—In my opinion, by far the most important piece of work that was done during the year was the levelling, stumping and rolling of an area of about 20 acres between the European Hospital and the K.A.R. lines, and round the Botanic Gardens. The whole of this area, which formerly was overgrown with bush, concealing borrow-pits is now available for the grass-cutting machine. I think that there is no doubt that owing to this measure, mosquitoes have been greatly reduced.

A tank and standpipe was erected in the K.A.R. lines. Previously, the men obtained their water from wells, but after two cases of typhoid had occurred, the walls were closed and the tank and standpipe erected.

A tank and standpipe was also erected outside the Boma.

Thirty dustbins were provided for the Station and Market.

A new native Cemetery was constructed.

The Town and Market were partly drained.

About 40 borrow-pits of variable size were filled up.

DEFICIENCY DISEASES.

Scurvy.—Six cases of scurvy occurred in the gaol among persons who never left the gaol, either because they were dangerous lunatics, or were incapacitated. All the cases were soon cured by giving appropriate diet. One suggests that the prolonged cooking in the gaol kitchen had destroyed the necessary vitamine, but that prisoners who worked outside the gaol were able to pick up sufficient herbs, berries, or other vegetable matter, to supply sufficient vitamine.

Spirillum Fever.—There were 12 cases of spirillum fever observed in which the diagnosis was confirmed by microscopical examination. Of these, three were European, three Indian, and six African. In only two of these cases was it certain that the disease was contracted in Tabora town; these were two Indian officials who occupied the same quarters in which spirillum ticks were subsequently found.

Of the native cases, five were soldiers of the K.A.R. and the other was the personal servant of an official from Dar-es-Salaam. One suggests that the local native is immune to the disease, as the spirillum tick is commonly found in the houses in the town and in the servants' quarters of the European houses in the Station. Presumably, the K.A.R. askaris, coming as they do from Nyasaland, are non-immune.

There were no deaths, and the cases were easily cured with intravenous injections of Neo-Kharsivan.

VENEREAL DISEASES.

The three varieties of venereal diseases occur in this district. Syphilis and gonorrhœa are prevalent in Tabora town, the population of which is 25,000, but I doubt whether it is more prevalent than in other African towns of the same size.

I do not think venereal disease is common in the country districts; I base this opinion on the results of medical examination of hundreds of recruits and labourers; 102 cases of gonorrhœa and 169 cases of syphilis were treated.

I should like to refer here to the great efficacy of Neo-Kharsivan, given intravenously, in clearing up many kinds of obscure diseases; no doubt these have a specific history.

GENERAL MEASURES.

(*b*) *Measures taken to spread the knowledge of Hygiene.*—Beyond the usual verbal advice, there have been no measures taken to spread the knowledge of hygiene; but when the new school is opened, it is intended that the Senior Sanitary Superintendent shall give lectures on elementary sanitary matters.

Recommendations for Future Work.

1. I have referred to the presence of the spirillum tick in Town and Station. I think this is a matter that will have to be dealt with in the future.

2. It would be of great advantage to extend the water main from its present terminus, near the Court House, to the Market Square. From the Kidete well, which is an artesian well, to the Market Square there is a fall of nine feet. I think that advantage should be taken of this fortunate circumstance.

3. The present brick-pit near the Botanic Gardens should be filled in. This could easily be done with trolleys on light rails bringing earth.

4. The roads in the commercial area require to be re-surfaced and drained.

TANGA.

Extract from a Report by Dr. A. I. Meek, Medical Officer of Health, Tanga.

1. Administrative.

(*a*) The following staff has been employed by this office during the year :—

European.—	Medical Officer of Health	1
	Sanitary Superintendents	2
	District Sanitary Inspector (Railways) ...	1
Africans.—	Clerk	1
	Sanitary Inspectors (Town)	3
	Sanitary Inspector (Railway)	1
	Vaccinators	2
	Carpenter	1
	Headmen (Town)	3
	Headman (Railway)	1
	Sanitary Labourers (Town)	96
	Sanitary Labourers (Railway)	29
	Convict Labourers	15

(*b*) *The town labour has been employed approximately as follows* :—

Grass cutting	15
Road clearing	20

Special gang (drain clearing, tree cutting, cemeteries, etc.)	9
Mosquito finders	3
Removal of refuse	16
Incinerators	8
Trolley boys	2
Boat boys	2
Office boy	1
Sanitation of native village	20

Convicts have been employed as follows :—

Conservancy work	5
Grass cutting and burial of paupers, clearing of Hospital and Customs Compound, etc.	10

(*c*) The work performed has consisted of :—

1. *Port Health.—i.e.*, boarding all incoming ships and dhows. Inspecting all passengers. Inspecting crews of dhows. Examining water tanks and barrels. Transporting sick to hospital when necessary and supervision of burial of dead bodies arriving by boat. Vaccinating passengers and crews when necessary. Care of sanitation of wharf and Customs compound.

2. *Public Abattoirs.*—Inspecting all car cases at slaughter house. Incineration of offal, excrete, blood, etc. Supervision of cleaning of Abattoirs, pound and surroundings. Inspecting all animals suspected to be suffering from disease.

3. *Special Epidemic Measures.*—Systematic vaccination of all persons in the township and out-districts. Vaccination of travellers, when necessary. Removal to hospital of infectious diseases cases. Tracing and segregation of contacts. Disinfecting of houses. Rat catching.

4. *Sanitation of Township.*—House to house inspections. Anti-mosquito work—such as collection of larvæ, digging new drains, drain clearing. Filling or oiling pools and swamps. Collection and disposal of household refuse. Road clearing. Grass cutting and tree lopping. Clearing of cemeteries. Supervision of cleansing of markets. Inspection of foodstuffs and destruction when necessary. Analysis of milk. Inspection of water supplies. Inspection of offensive trades. Attendance in court in connection with sanitary prosecutions.

Clearing of site and erection of temporary small-pox camp. Supervision of convict labour. Conservancy work. Supervision of sanitation work of gaol. Supervision of erection of buildingse, etc. Clearing of hospital compound and general sanitation. Meteorological observation.

5. Railway Sanitation.—Supervision of railway premises at Tanga and at station from Tanga to Voi.

(*b*) *The Approximate cost of Work done* :—

Under the following headings, including European and Native salaries and approximate upkeep of equipment, but excluding Railway Sanitary Labour and D.S.I. Salary is roughly estimated as follows :—

(1) Port Health work	£378	16
(2) Public Abattoir	126	08
(3) Special Epidemic Measures ...	100	08
(4) Native Area	796	00
(5) European Area	2,099	13
(6) Supervision of Railway Sanitation	136	00
	£3,637	05

2. METEOROLOGICAL RETURN FOR 1922—TANGA.

Total Rainfall during the year ...	53·078 inches.
Maximum monthly Rainfall (May) ...	23·390 inches.
Maximum daily Rainfall (May 22nd)	3·250 inches.
Mean noon Temperature for the year	27·38°C.

	Rainfall in Inches.			Temperature oC.		
	Total.	Heaviest Fall.	Date.	Maximum Noon.	Minimum Noon.	Mean Noon.
January ...	—	—	—	30·3	27·3	28·60
February ...	0·500	0·45	13th	29·2	28·1	28·60
March ...	2·590	1·360	23rd	30·0	26·6	28·60
April ...	7·240	2·320	18th	30·0	27·5	28·40
May	23·390	3·250	22nd	28·31	25·0	26·23
June	7·085	2·500	21st	27·50	24·44	25·97
July	2·100	0·625	7th	26·66	23·99	25·27
August ...	2·031	0·375	8th	26·40	24·40	25·42
September ...	1·317	0·500	3rd	27·22	24·72	25·97
October ...	0·992	0·500	15th	29·16	27·22	28·19
November ...	5·690	2·657	1st	29·16	27·22	28·19
December ...	0·643	0·220	19th	30·00	28·00	29·10

3. VITAL STATISTICS FOR 1922.

(*a*) *Tanga District.*

European Births notified ...	6
,, Deaths ,, ...	5
Asiatic ,, ,, ...	20
Total African native Deaths ...	1,335
Native population, Tanga district	86,404
Native Death Rate	15·4 per 1,000 living.
African Births	965
Native Birth Rate	11·1 per 1,000 living.
Native Deaths under one year ...	130
Infantile mortality figure ...	134

(*b*) *Native Death Rates of Tanga Sub-Districts, 1922.*

Sub-District.	*Population.*	*Deaths.*	*Death Rates.*
Tanga	16,023	206	12·8
Tangate	4,107	58	14·1
Pongwe	4,392	92	20·9
Ngomeni	6,049	125	20·6
Muheza	10,912	144	12·2
Mnyussi	6,742	127	18·8
Amani	4,126	28	6·7
Marimba	3,998	71	17·7
Buiti	9,155	171	18·6
Gombero	5,916	54	9·1
Moa	14,984	188	12·5
Tanga Hospital	—	71	—
Tanga District	86,404	1,335	15·4

Preventive Measures.

Small-pox.—82 cases and 14 deaths occurred in the following sub-districts :—

District.	*Cases.*	*Deaths.*
1. Buiti	48	6
2. Muheza	17	4
3. Gombero	11	4
4. Ngomeni	3	*Nil.*
5. Marimba	1	*Nil.*
6. Kigombe	1	*Nil.*
7. Tanga	1	*Nil.*
	82	14

The total case mortality was 17 per cent. giving a death rate of ·16 per 1,000 living. As compared with the figures for 1921, *i.e.*, cases 412, case mortality 33 per cent. and death rate 1·5, a considerable reduction is noted, no doubt due to the extensive systematic compaign of vaccination carried on during the year.

Akidas were given instruction regarding preventive measures to be taken against the spread of the disease.

Vaccination performed during the year amounted to 36,477, with approximately 80 per cent. of successful results.

On December 31st, 1922, no cases of small-pox remained in the district.

Chicken-pox.—Six cases were notified. In each case the district concerned was visited and usual precautions taken. Akidas were instructed to report fresh cases at once and treat as if small-pox.

Respiratory affections, according to Akidas' reports, caused 24·1 per cent. of the total deaths. Twenty cases of influenza, several cases having chest complications, were noted in the Ngomeni sub-district in August. No doubt a number of deaths in outlying districts were attributable to this disease. The 11 deaths in Tanga Hospital were reported to be due to bronchitis, pneumonia and phthisis.

Ankylostomiasis, *diarrhœa*, *dysentery*, *etc.*—These diseases claim 40·4 per cent. of the total deaths. Ankylostomiasis shows a slight improvement, *i.e.*, 21·4 per cent. of deaths compared with 28 per cent. in 1921.

An effort was made in the township to improve the water supply.

One new well is being dug and the Public Works Department were asked to clean and repair all existing wells. This has not been done satisfactorily owing to lack of funds and necessary apparatus. There is room for a great deal of improvement in this direction. An inspection in the township revealed the fact that a large number of native householders had no latrine in their compounds; 438 were ordered to be dug. While this may improve matters in one way, we are up against the fact that these native pit latrines form ideal breeding places for fly maggots, owing to the carelessness on the part of the native in leaving them uncovered. An attempt was made to remedy this nuisance. An endeavour was made to check the practice in the native township of having shallow unlined wells used for drinking water in private compounds (in many cases in close proximity to pit latrines). It will not be possible to entirely abolish this system until a sufficient alternative pure water supply is provided by the Government. Forty-three collections of fly maggots were found. 15,483 cart loads of refuse removed. Thirty-seven dumps were removed. One hundred and twenty-two lots of foodstuffs were condemned and destroyed.

Regarding out-districts, no great headway will be made until by frequent tours of inspection, sanitary supervision by a qualified inspector, preferably European is carried out. In the meantime, instruction is being given when possible to Akidas Jumbes, etc., with reference to elementary sanitary principles. The native sanitary inspectors and vaccinators have also received periodical lectures on the elementary principles of Tropical Sanitation.

ANTI-MOSQUITO WORK.

Premises inspected	40,752
Collection of mosquito larvæ found including 67·5% Culex 30·7% Stegomyia and 1·8% Anopheles.	450
Prosecutions (re-breeding of mosquito larvæ)	7
Convictions	7
Drains inspected and oiled	10,836
Cesspits and soakage pits inspected and oiled	57,012
Pools inspected and oiled	152
Wells inspected and oiled	6,631
Tanks and barrels inspected and oiled ...	55,842
New drains cut, linear feet	6,900
Ditches cleared, linear feet	1,083,734
Grass cut, square yards	3,068,639
Pits filled in	28
Kerosine oil used, gallons	116

PORT HEALTH.

Steamers boarded during the year	180
Dhows boarded during the year	757

OTHER WORK DONE.

School children examined	1,452
Burials performed	25
Trains inspected	325
Notices served	405
Prosecutions other than mosquito larvæ ...	17
Convictions other than mosquito larvæ ...	11

REPORT ON DAR-ES-SALAAM BY Dr. R. N. NIXON, MEDICAL OFFICER OF HEALTH.

The health of the community during 1922 has been good with the exception of the heavy incidence of malaria, and the year has seen real progress.

There have been mild epidemics of influenza, beri-beri, and mumps. There has been no plague and one case only of small-pox.

Malaria has been by far the predominant cause of sickness. Notification of the disease by practitioners has been initiated this year and the high morbidity rate among all classes can be seen more clearly The progress in the reduction of mosquitoes has been maintained, but a great amount of anti-mosquito work remains to be done. The most satisfactory feature of the year is the big step forward in the improved distribution of the water supply.

Other works of great benefit to the town are the improvements in the Carrier Corps neighbourhood—the new market and the surrounding town-planning—and the construction of the Chafu Koga surface drain.

Our main tasks for the future, in addition to anti-mosquito measures and further improvement of the water supply, are anti-plague measures, improvement of our conservancy system and remodelling of much of the overcrowded Indian area.

SANITARY ADMINISTRATION.

Staff.

1 Medical Officer of Health.
1 1st Grade Sanitary Superintendent.
1 2nd Grade Sanitary Superintendent.
1 Storekeeper (Temporary 2nd Grade Sanitary Superintendent).
1 Compounder.
1 1st Class Sanitary Inspector.
1 Asiatic Clerk.
1 Native Clerk.
8 Native Sanitary Inspectors.
15 Headmen.
251 Labourers.
5 Vaccinators.
3 Boat Boys.
1 Male Nurse. }
1 Female Nurse. } Infectious Diseases Hospital.
7 Labourers.
13 Latrine Sweepers.

1 Native Carpenter and 1 Native Mason.
3 Rat Boys.

Staff Changes, 1922.

Mr. F. A. Gemmell.—Appointed as Temporary 2nd Grade Sanitary Superintendent (Storekeeper), February, 1922.

Mr. C. W. Strutt.—2nd Grade Sanitary Superintendent (Storekeeper) left for United Kingdom on leave, May, 1922.

Dr. R. R. Scott, M.C.—Medical Officer of Health, left for United Kingdom on leave, May, 1922.

Dr. R. Nixon.—Medical Officer of Health. Transferred from Tanga to Dar-es-Salaam, May, 1922.

William Pepo.—Native Sanitary Inspector. Transferred to Lindi on 25th October, 1922.

Isaac Mkandawire.—Native Sanitary Inspector. Transferred to Morogoro on 10th November, 1922.

Mr. D. A. S. Nanayakkara.—3rd Grade Asiatic Clerk. Left for Ceyon on leave on 3rd December, 1922.

T. G. E. Harawa.—Native Clerk. Transferred from the Principal Medical Officer's Office on 25th November, 1922.

Employment of Sanitary Labour.

The Sanitary Labour has been employed roughly as follows :—

Mosquito Destruction.
Mosquito Draining and Filling.
Street Sweeping.
Refuse Collection.
Refuse Destruction.
Latrine Cleaning, Hedge Cutting.
Upkeep of Cemeteries.
Market Cleaning.
Native Carpenter and Mason.

Mosquito Boys.

These are divided into two sections working under Mr. Souza, the 1st Class Sanitary Inspector. The first section, the Finders, periodically inspect each part of the town for mosquito breeding places which are dealt with by oiling, etc.

The second section consists of drainers and fillers, dealing with the long lengths of drains—principally earth ones—filling up holes and depressions in the mosquito breeding areas and swamps.

Road Sweepers.

Three gangs sweep and clean the streets every day. All refuse is disposed of by burning.

Refuse Collection and Destruction.

Ox transport is used for this, total of 12 carts being in use every day; 27,180 loads of refuse were collected from the Town and disposed of by burning at the Town Incinerators at " Chafu Koga."

" Chafu Koga," three years ago one of the low-lying parts of the Town and the collecting place of all surface water, has now been practically filled and levelled up.

A small hollow, near by, has also been satisfactorily dealt with.

A new area, Carrier Corps Swamp, is now being dealt with in a similar manner.

Six new ox carts were obtained locally this year, one of which has been sent to Bagamoyo. These were bought as several of our carts are now practically worn out, being old military ones, which have been repaired many times by the native carpenter and periodically made fit for further service.

Public Latrines.

Nine public latrines have been in use during the year. The excreta being disposed of by incineration. Thirteen boys have been employed in this work.

The Public Works Department are now putting in a water carriage system to the latrine near the Post Office. When this is completed, one latrine and incinerator, which at times causes annoyance to the residents near by, will be abolished.

The new latrine will be connected to the sewer in Suleman Street.

Hedge Cutting and Tree Cutting.

Boys have been employed in cutting and trimming the hedges in the Town during the year.

The Agricultural Department have the control of the tree-cutting gang, all matters relating to cutting of trees for health reasons being referred to this Department.

Upkeep of Cemeteries.

Three boys were allotted to the upkeep of the five cemeteries in Dar-es-Salaam. This was found to be insufficient and the number was increased to six boys, three more being detailed from the General Duty Gang.

All European and Native burials are carried out by these boys.

The five cemeteries periodically cleaned are the Upanga Military Cemetery; the Old German and Military Cemetery at Sea View; the Old German Cemetery near the Sewa Hadji Hospital; the Native Christian (Military) Cemetery in the Gerezani area, and the Old Military Carrier Corps Cemetery.

All native pauper burials are carried out in the last-mentioned place.

Market Cleaning.

Boys are employed in this work and come under this office for pay and discipline.

They are sweeping up all the day, and after the market is closed and empty at 5 p.m., the whole of it is thoroughly cleaned up in readiness for the next day.

Native Carpenter and Mason.

One Native Carpenter and one Mason are employed full time by this Office; the former does all the repairs to carts and tools, makes boxes, etc.

The Mason does small repairs to cesspit covers and drains, defects being remedied at once.

The larger works are referred to the Public Works Department for attention.

CLIMATE AND METEOROLOGY.

Rainfall.

The total rainfall for the year was 34·085 inches.

The rainiest months were May, 11·55 inches; March 9·66 inches.

The rainiest day was May 9th; 4·20 inches.

Rain fell on 102 days.

The comparison with previous years is as follows :—

	Total Fall.	No. of days on which rain fell.
German records. Average of 19 years	42·60 inches.	—
1919	34·06 ,,	77
1920	24·63 ,,	83
1921	33·90 ,,	82
1922	34·08 ,,	102

The total rainfall was therefore approximately the same as that of 1921 and 1919, and a considerable improvement on that of the dry year 1920. The rainfall of 1922 was, however, characterized by an unusual distribution throughout the dry season. The normal year shows two or more months (usually July and September) in which no rain falls. In 1922 rain fell on seven days in July; eight in August and eight in September. The increase in the number of rainy days as compared with previous years is almost entirely due to the increase during the dry months, rain falling on 31 days during the months of July-October, as compared with 15 days during the corresponding months of 1921.

The following charts illustrate the unusual character of the dry season of 1922 :—

(*a*) Monthly rainfall of 1920, 1921 and 1922.

(*b*) Rainy days per month 1921 and 1922 (1920 figures incomplete).

Rainfall of this character is more beneficial to the land than the usual uneven distribution, but is also, unfortunately, more beneficial to mosquito-breeding as completely dry months mean the evaporation of all but the largest collections of water and subsequent low humidity.

TEMPERATURE.

From records supplied by the Director of Laboratory :—

	1921.	1922.
	Centigrade. Deg.	Centigrade. Deg.
Mean T.° of year (mean of monthly means)	26·13	26·22
Maximum monthly mean (January) ...	28·8	29·1
Minimum monthly mean (July)	24·1	23·3
Maximum recorded T.°	—	37·0
Minimum recorded T.°	—	17·0

HUMIDITY.

	1921.	1922.
	Per Cent.	Per Cent.
Mean humidity of year (mean of monthly means)	72·4	73·1
Minimum monthly mean humidity ...	65·5	69·9
Maximum monthly mean himidity ...	81·5	78·9
Average humidity of the "wet season" (months of March, April and May) ...	75·6	74·4
Average humidity of the "dry season" (months of June to October inclusive) ...	68·8	73·2

The temperature records of the year present no outstanding features, but the monthly humidity figures are of an unusually uniform character. It will be seen from the above figures that the humidity of the so-called dry season was as high as the average of the year and approximately as high as that of the rainy months. I have already commented on the unusual character of the dry season of 1922 under the heading of " Rainfall."

The humidity chart illustrates this exceptional dry season even better than that of the rainfall. The humidity of 1922 reached neither the maximum nor minimum recorded in 1921, and the deviation from the mean was never great throughout the year

This relatively high humidity during the hot and dry months is of considerable importance for the mosquito is provided with more favourable living conditions and greater facilities for breeding, and there is an increase in mosquito-borne disease, particularly malaria; it also means a more trying hot season than usual for Europeans and a consequent presumptive lowered resistance to infection.

VITAL STATISTICS.

It is not yet possible to compile satisfactory vital statistics for Dar-es-Salaam owing to lack of full particulars of the births and deaths in the town. Detailed information is available only in the cases of European births and deaths and of the deaths of non-Europeans in the hospitals. There is no record of Asiatic or African births. Some of the Asiatics and almost all the Africans dying outside the hospital are not seen by a medical practitioner before death. Each death is, however, notified to the Medical Officer of Health and the body is inspected by the Medical Officer of Health, a Sub-Assistant Surgeon, or a Compounder, and the apparent cause of death stated on the burial certificate. It is neither possible nor desirable to make a post-mortem examination in the majority of cases. In the cases in which there are no attendant circumstances suggestive of death from violence or from infectious disease, the diagnosis of the cause of death is based on the appearance of the body and on the history of the illness as given by the relatives. In these circumstances, it is not surprising to find such vague diagnoses as " debility," " anæmia," " diarrhœa," " pyrexia," etc., occurring with some frequency. Indeed, all the diagnoses based on history and post-mortem appearance only are obviously of little scientific value, and it is unjustifiable to draw deductions from them. The following tables for the year 1922 are attached.

(*a*) *Number and Causes of European Deaths.*

All the European deaths are recorded. All the cases were seen by a medical practitioner before death. The table may therefore be accepted as accurate, but the figures are too small to base any comparative statistics on them.

There were 11 deaths as compared with seven in 1921. The European death-rate was 19·9 per 1,000. There was no outstanding cause of death.

(*b*) *Number and Causes of Asiatic Deaths.*

I have sub-divided these into the deaths occurring in hospital and those occurring in town. The cases dying in hospital were seen by a Medical Officer or Sub-Assistant Surgeon before death and the causes of death may be accepted. There is a factor of error in the town cases as some were not seen by a medical practitioner before death. On the whole, this table may be accepted as of real value in indicating the number and causes of Asiatic deaths. There were 44 deaths as compaied with 52 in 1921.

The death-rate was 10·98 per 1,000. There were 11 deaths from pneumonia—a normal figure. There was no oustanding cause of death. In considering this very low death-rate as compared with Europe or Asia, it must be remembered that both the European and Asiatic populations of this territory are selected ones as regards sex, previous health, and particularly as regards age.

(*c*) *Number of Causes of African Deaths.*

It is here that the factor of error on which I have already commented becomes prominent. Only 41 of the 184 native deaths recorded occurred in hospital; that is, the large majority of the remaining 143 were not seen by any skilled observer before death. There is, therefore, an appreciable amount of guess-work in the diagnosis. The actual total of 143 is an under-statement. In particular, I do not regard the figure of 13 deaths of children as even approximately accurate. The African regards the death of a child as of relatively little importance and finds a quiet interment easier than a report to an official. In time, I believe, they may be persuaded to report a much larger proportion of their infant deaths. The number of deaths notified was 184 as compared with 170 in 1921.

The death-rate was 14·9 per 1,000. There is no outstanding cause of death. Eighty-four deaths were ascribed to pulmonary conditions; 27 to malaria or pyrexia; 22 to intestinal conditions.

European Deaths.

Cause.	Men.	Women.	Children.	Total.
Organic Heart Disease ...	3	—	—	3
Malaria	—	—	1	1
Blackwater Fever	1	1	—	2
Typhoid Fever	—	1	—	1
Diabetes	1	—	—	1
Neuritis	1	—	—	1
Diarrhœa	1	—	—	1
Hyperpyrexia	—	—	1	1
Total	7	2	2	11

European Births.

Fourteen European births were recorded during the year, giving a European birth-rate of 25·2 per 1,000.

ASIATIC DEATHS.

Cause.	Hospital Cases.				Town Cases.				Total.			
	M.	W.	C.	T.	M.	W.	C.	T.	M.	W.	C.	T.
Pneumonia	3	1	—	4	4	3	—	7	7	4	—	11
Pulmonary T.B. ...	—	—	—	—	1	—	—	1	1	—	—	1
Bronchitis	—	—	—	—	1	2	—	3	1	2	—	3
Malaria	—	1	—	1	1	1	—	2	1	2	—	3
Hyperpyrexia ...	—	—	—	—	2	—	—	2	2	—	—	2
Enteric	—	1	—	1	—	—	—	—	—	1	—	1
Dysentery	—	—	—	—	1	—	—	1	1	—	—	1
Diarrhœa	1	—	—	1	—	1	—	1	1	1	—	2
Prematurity	—	—	1	1	—	—	2	2	—	—	3	3
Convulsions	—	—	—	—	—	—	5	5	—	—	5	5
Nephritis	1	—	—	1	—	—	—	—	1	—	—	1
Cystitis	1	—	—	1	—	—	—	—	1	—	—	1
Cystical Calculus ...	1	—	—	1	—	—	—	—	1	—	—	1
Retained Placenta ...	—	1	—	1	—	—	—	—	—	1	—	1
Puerp. Septicæmia ...	—	—	—	—	—	2	—	2	—	2	—	2
Scalds	1	—	—	1	—	—	—	—	1	—	—	1
Apoplexy	1	—	—	1	—	—	—	—	1	—	—	1
Diabetes	—	—	—	—	1	—	—	1	1	—	—	1
Icterus Neonatorum...	—	—	—	—	—	—	1	1	—	—	1	1
Laryngitis	—	—	—	—	—	1	—	1	—	1	—	1
Heart Disease ...	—	—	—	—	—	1	—	1	—	1	—	1
	9	4	1	14	11	11	8	30	20	15	9	44

African Deaths.

Cause.	Hospital Cases.				Town Cases.				Total.			
	M.	W.	C.	T.	M.	W.	C.	T.	M.	W.	C.	T.
Pneumonia	13	—	—	13	13	13	5	31	26	13	5	44
Pulmonary T.B. ...	4	2	—	6	23	4	—	27	27	6	—	33
Bronchitis	—	—	—	—	2	—	—	2	2	—	—	2
Pleurisy	1	—	—	1	1	—	—	1	2	—	—	2
Broncho-pneumonia	1	—	1	2	1	—	—	1	2	—	1	3
Malaria	—	—	1	1	5	6	—	11	5	6	1	12
Pyrexia	—	—	—	—	8	3	4	15	8	3	4	15
Dysentery	—	—	—	—	2	2	—	4	2	2	—	4
Diarrhœa	—	—	—	—	3	3	1	7	3	3	1	7
Enteritis	—	—	1	1	1	2	—	3	1	2	1	4
Ankylostomiasis ...	4	—	—	4	1	2	—	3	5	2	—	7
Anæmia	—	—	—	—	6	3	—	9	6	3	—	9
Old Age	—	—	—	—	6	9	—	15	6	9	—	15
Syphilis	2	—	—	2	1	—	—	1	3	—	—	3
Hernia	1	—	—	1	—	—	—	—	1	—	—	1
Debility	1	—	—	1	1	—	—	1	2	—	—	2
Heart Disease ...	—	—	—	—	2	—	—	2	2	—	—	2
Icterus Neonatorum	—	—	—	—	—	—	3	3	—	—	3	3
Ascites	—	—	—	—	1	—	—	1	1	—	—	1
Hæmorrhage... ...	—	—	—	—	—	1	—	1	—	1	—	1
Septicæmia	—	—	—	—	2	—	—	2	2	—	—	2
Jaundice	—	—	—	—	1	—	—	1	1	—	—	1
Influenza	1	—	—	1	—	—	—	—	1	—	—	1
Tetanus	—	2	—	2	1	—	—	1	1	2	—	3
Beri-beri	5	—	—	5	—	—	—	—	5	—	—	5
Nephritis	1	—	—	1	1	—	—	1	2	—	—	2
	34	4	3	41	82	48	13	143	116	52	16	184

INFECTIOUS DISEASE.

The following table gives the number of cases and the number of deaths from each of the notifiable infectious diseases during 1922.

Disease.	Number of Cases.	Number of Deaths.
Beri-beri	33	5
Cerebro-spinal Meningitis	—	—
Chickenpox	5	—
Cholera	—	—
Diphtheria	1	1
Typhoid Fever	5	2
Paratyphoid Fever	1	—
Relapsing Fever	3	—
Influenza	69	5
Leprosy	8	1
Measles	4	—
Mumps	37	—
Plague	—	—
Scarlet Fever	—	—
Smallpox	1	—
Sleeping Sickness	—	—
Yaws	6	—
Yellow Fever	—	—

These figures are, on the whole, satisfactory and particularly as regards plague, small-pox, and the intestinal infections.

The 14 deaths comprise one European (typhoid fever), three Asiatics (two from post-influenzal pneumonia) and nine Africans. It is necessary to refer to certain of the diseases in the above list in more detail.

BERI-BERI.

In May an epidemic of beri-beri broke out amongst the natives of the K.A.R. stationed at Dar-es-Salaam. The majority of the cases occurred almost simultaneously and there were 33 admitted to Sewa Hadji Hospital, of whom five died. The K.A.R. diet was altered by the substitution of unhusked rice and beans for the husked varieties then in use and by the liberal addition of fresh vegetables. There was an immediate and steady improvement, and no further cases have occurred since July.

INFLUENZA.

Influenza epidemic proportions in Dar-es-Salaam in February and March. Fifty-nine cases were reported during these two months and five deaths occurred—two Asiatics and three Africans--four of them being ascribed to post-influenzal pneumonia. Ten further cases ocucrred during April and May. No case was reported after the end of May.

MUMPS.

A few isolated cases of mumps were reported during the earlier months of the year. A mild epidemic occurred amongst the African population in October, 18 cases being admitted to the Infectious Diseases Hospital during the first week of this month. The total for the year was 37 cases, and during December, only four new cases were admitted. No deaths occurred.

PLAGUE.

On July 16th, Dhow 35K arrived in Dar-es-Salaam from Zanzibar. The health of passengers and crew was stated to have been good during the voyage, but a few hours after her arrival in harbour the native captain died suddenly on board. A post-mortem examination was made and appearances found suggestive of death from plague, but bacteriological confirmation was not conclusive. No rats were found on the vessel, the crew and passengers detained for observation during the incubation period remained healthy, in investigation at Zanzibar failed to elicit any likely source from which the deceased could have contracted plague. In these circumstances and having regard to the lack of bacteriological confirmation, the tentative diagnosis of plague was not considered established. Preventive measures, were, however, taken with regard to the vsssel, passengers and crew. No case of plague occurred in the town.

THE NECESSITY FOR ANTI-PLAGUE MEASURES.

Dar-es-Salaam's position as regards plague demands serious attention. We are in regular communication both by land and sea, with centres in which plague is endemic or in which sporadic cases are liable to occur from time to time. We have a large rat population. We have practically no rat-proofing, that is, our rats have almost uninterrupted access to most of the food-stores and shops in the town. This not only allows them to live in plenty, but provides ready means for the transmission of the disease to man in the event of the rats becoming infected. We have enjoyed immunity from plague in Dar-es-Salaam for several years, but no preventive measures can be absolutely proof against the entrance of a plague patient or an infected rat to the town and, in such a contingency, there would be great difficulty, under present circumstances, in preventing the disease assuming epidemic proportions.

There are two anti-plague precautions which we should follow to the full extent of our power, firstly, the destruction of rats, and secondly, the protection of our large food-stores from rats.

Rat Destruction.

A vigorous campaign has been waged against rats during 1922. Two rat-catchers were employed, mainly in the commercial area, during the first six months of the year, but, owing to reports of the increasing numbers of rats in the European houses, a third rat-catcher was engaged at the end of June and has been employed solely in the European residential area from July to December. The number of rats caught, month by month, by these three rat-catchers, was as follows :—

January	282
February	148
March	128
April	190
May	175
June	262
July	352
August	469
September	442
October	619
November	708
December	580

A total of 4,355 rats were caught by the rat-catchers during the year :—

First Quarter	558
Second Quarter	627
Third Quarter	1,263
Fourth Quarter	1,907

It will be seen that more than three times as many rats were caught in the last quarter as in either of the first two. The increase is, however, much greater than this for the arrival of a new consignment of traps late in the year admitted of their issue in certain cases to individual householders. The number of rats destroyed in this way is unknown, but one official reported 27 caught on his premises within a week. At the request of the Senior Commissioner, 24 traps have been lent to the town Jumbes, but there is no record yet of the result of this experiment. It is a fair inference that, in the last quarter of the year Dar-es-Salaam rats were being destroyed in four or five times as large numbers as in the first quarter. If this were entirely due to increased efficiency in catching, to such factors as the new rat-catcher, the professional rivalry of the former ones, the new traps and the assistance of householders, the result would be eminently satisfactory. Unfortunately, the prevalence of rats in the town has not, as far as can be ascertained, decreased with the increase in the numbers caught. One of the factors contributing to the increase catch appears to be a large increase in the rat population—a natural result of their life in a township in which they have such ready access to foodstuffs and can live a life of ease and plenty.

The Rat-Proofing of Food-Stores.

In Dar-es-Salaam there are a large number of Indians trading in rice, flour, potatoes and other foodstuffs. It was suggested that their stocks might be protected against rats either by the provision of rat-proof stores in their compounds or by the storing of the foodstuffs in rat-proof bins. A detailed examination of the premises and of the stocks revealed difficulties in the adoption of either of these schemes. The amount of foodstuffs held by the Indian traders was almost incredibly large, having regard to the size of the stores and shops. Twenty stores were examined, with the following results :—

2 stores contained between 50,000 and 60,000 lbs. of foodstuffs.
1 store ,, ,, 40,000 ,, 50,000 ,, ,, ,,
2 stores ,, ,, 30,000 ,, 40,000 ,, ,, ,,
7 other stores contained more than 5,000 lbs. of foodstuffs.
5 ,, ,, ,, ,, ,, 1,000 ,, ,, ,,

None of these stores were protected against rats.

The typical grain-store of Dar-es-Salaam is a combined shop and dwelling-house in the Indian area. The grain is stored in bags in rooms, corridors, alcoves and outbuildings, and in many cases occupies almost the whole ground floor of the premises. The houses were built prior to the introduction of our Building Rules and consequently cover almost the whole of the building plot, a negligible area only being left as compound. This fact disposes of the proposal to build-rat-proof stores in the compounds. The preceding list gives an idea of the amounts of stock held by the grain dealers. In many cases the erection of a rat-proof store, large enough to contain the stock, normally held, would necessitate the demolition of of almost the whole of the existing building. Reform of local grain-storage could be directed on the following lines within a comparatively short time :—

(*a*) An area of land near the town to be allocated for the erection of rat-proof go-downs.

(*b*) Grain-dealers whose premises are small or badly constructed and whose stocks are so large as to be incompatible with adequate bin-storage on the premises to be compelled to erect or rent a rat-proof go-down.

(*c*) Small holders to instal rat-proof bins in one or more suitable rooms of their store and to keep only such amounts of grain as can be accommodated in the bins.

(*d*) Petty general traders, whose grain-dealings are small and whose premises do not admit of bins being installed in a suitable place, to be prohibited from storing grain. There are 627 Indian traders in the town and many fall in to this last category. Prohibition of their grain trade would deprive them of one source of income, but they have many other lines of trade and the step is a justifiable one if they are unable to protect their stock from rats.

SMALL-POX AND VACCINATION.

It is satisfactory to report that, in spite of our regular communication both by land and sea with infected centres, only one case of small-pox has occurred in Dar-es-Salaam throughout the year.

The case in question, an African native recently arrived from Morogoro, was admitted to the Infectious Diseases Hospital on April 24th. Preventive measures were taken, contacts vaccinated, etc., and no other case occurred in the town. The patient was discharged from hospital a month later.

All vessels from infected ports and trains from infected centres inland were inspected on arrival at Dar-es-Salaam and all the unprotected passengers vaccinated.

In addition to the vaccinations on dhows and trains, 398 vaccinations were performed at the Health Office. These were, for the most part, passengers proceeding to Tanga, Tabora, or some other infected centre and were not, therefore, seen on any subsequent occasion, so that no records are available of the results of their vaccination.

There has been a demand for native vaccinators in the out-stations, and eight have been trained at the Health Office during the year. Two of these have already left for Lindi and Moshi and the other six are expected to be posted shortly.

LEPROSY.

Eight cases of leprosy were reported in Dar-es-Salaam during the year. Twelve deaths occurred in the leper settlement at Nunge. It must be admitted that our present method of dealing with leprosy is unsatisfactory. Lepers found in the town are apprehended and taken to Nunge settlement.

This settlement is about four miles from Dar-es-Salaam and can be reached by boat or by road. The movements of the lepers are not restricted, there is a large area, there are two attendants only, and there is no boundary fence. The lepers in the settlement must then be considered either in an advanced state of the disease or voluntarily segregated, for those able to walk are also able to leave the settlement, and proximity to a large town facilitates escape. The result is that those remaining in the settlement, do so, because their lesions are so obvious that immediate apprehension seems probable, because they are crippled by the disease or because they have domestic ties in the settlement. The Nunge settlement is, therefore, unusual in the smaller number of its early cases and of inmates capable of hard work.

The following is an approximate record of the present condition of the lepers at Nunge :—

Condition.	Men.	Women.	Children.	Total.
Suffering from lesions of hands ...	2	6	—	8
Suffering from lesions of feet ...	6	2	—	8
Suffering from lesions of both hands and feet	17	16	—	33
This figure includes the follow-number whose fingers and toes are completely destroyed	(6)	(4)	(—)	(10)
Suffering from leprosy and another concurrent disease	7	2	—	9
Fairly fit (maculæ, bullæ or minor lesions)	9	7	8	24
TOTAL	41	33	8	82

It will be obvious that from such a population little work can be expected and that this particuar settlement calls for unusual assistance in many ways. It cannot be self-supporting, and food and clothing must be supplied. It needs medical attention, drugs and dressings to a greater extent than other settlements.

Nunge has, up to date, been controlled by the Senior Commissioner Dar-es-Salaam, who has administered it through a native overseer living on the spot, supplied monthly rations and visited it at intervals. Both the Senior Commissioner and the Medical Officer of Health felt that medical control was called for. A native dresser was appointed under the control of the Health Department and the Medical Officer of Health arranged to visit the settlement two or three times a month. The system has worked fairly well. The dresser, who reports at least once a week at the Health

Office, has proved quite satisfactory, drugs and dressings have been supplied regularly, concurrent diseases have been treated, and several minor operations performed. Dual control has naturally, however, proved unsatisfactory, and it is felt that this particular settlement might with advantage be taken over entirely by the Sanitation Department.

Medical treatment of the lepers at Nunge, must, unfortunately, be regarded as palliative only. Our hopes of curing leprosy rest at present on intravenous injections of the ethyl esters of chaulmoogra oil. We have neither the staff nor the facilities for adopting this treatment at the settlement and its value in advanced cases, who constitute the bulk of the Nunge inmates, is still problematical. Seven selected cases have received weekly injections at the Infectious Diseases Hospital, Dar-es-Salaam, throughout the year. Six of these show a definite improvement, but it is not proposed to continue the treatment with all of them. The Infectious Diseases Hospital is not suitable for keeping lepers for long periods; advanced cases possibly require years of treatment and some of the patients become restless of their restricted movements and wish to return to their homes or to Nunge. The treatment will be continued with three of the patients who feel that their improvement has been marked and are anxious not to relapse. In addition to the appointment of a resident dresser and regular medical visiting, the following improvements have been effected at Nunge during the year :—The food ration has been increased, the well has been repaired, and a new house has been erected.

TYPHOID AND DYSENTERY.

The following intestinal infections were reported :—

Disease.	Europeans.	Asiatics.	Africans.	Total.
Typhoid Fever	2	3	—	5
Paratyphoid Fever	1	—	—	1
Amœbic Dysentery	9	2	7	18
Bacillary Dysentery	2	—	—	2
Intestinal Schistosomiasis ...	—	—	2	2

The last three diseases were not notified in 1922 and the cases are taken from records of the Director of Laboratory. Entamœba histolytica was obtained from all the above cases diagnosed as Amœbic dysentery. Flexher Y was obtained from both bacillary cases.

INFECTIOUS DISEASES HOSPITAL.

It is hoped that the work of enclosing this hospital area by a stout fence will be put in hand in 1923.

The admissions during 1922 were as follows :—

Disease.	Admissions.	Remaining on 1/1/23.	Deaths.
Mumps	37	2	—
Ringworm	18	—	—
Tuberculosis	14	—	(Phthisis). 4
Yaws	9	—	—
Scabies	8	—	—
Chiggers	8	—	—
Leprosy	6	5	1
Dermatitis	6	—	—
Chickenpox	4	1	—
Smallpox	1	—	—
Tetanus	1	—	—
Contacts	19	—	—
	131	8	5

MALARIA.

Malaria is, as in previous years, incomparably the chief cause of sickness amongst all classes of the community. In 1922 we have been provided with a new means of estimating the prevalence of malaria in Dar-es-Salaam as the disease became notifiable by medical practitioners. The value of notification in the case of African natives is obviously very small, as the average African does not seek medical attention for an attack of malaria. The figures given below are, therefore, those of the European and Asiatic communities only.

The following notifications were received during 1922 :—

Cases of malaria confirmed microscopically ...	382
Cases of malaria unconfirmed	186
Total European and Asiatic notifications ...	568
European notifications	147
Asiatic notifications	421

This gives the following morbidity-rates from malaria :—

European morbidity-rate = 265 per 1,000.
Asiatic morbidity-rate = 105 per 1,000.
Combined morbidity-rate = 124 per 1,000.

The confirmed cases may be subdivided as follows :—

Subtertian cases	225
Benign tertian cases	157
Quartan cases	0
Total ...	382

The following table is an analysis of the European and Asiatic malaria notifications of 1922 :—

Type.	Men.	Women.	Children.	Total.
Europeans—				
S-Tertian	84	18	3	105
B-Tertian	20	3	1	24
Parasites not found ...	14	3	1	18
European Total ...	118	24	5	147
Asiatics—				
S-Tertian	99	19	2	120
B-Tertian	115	11	7	133
Parasites not found ...	144	15	9	168
Asiatic Total	358	45	18	421
Combined Total ...	476	69	23	568

The blackwater fever cases may, I think, properly be included in this section. The notifications were as follows :—

	Men.	Women.	Children.	Total.
Europeans	7	1	—	8
Asiatics	2	1	—	3
Total	9	2	—	11

Malaria Death-Rates.

Although the morbidity-rates are so high, the deaths ascribed to malaria and allied conditions are gratifyingly low. Our European death is ascribed to malaria and two to blackwater fever. Three Asiatic deaths are ascribed to malaria. The African deaths ascribed to malaria or pyrexia are, with one exception, post-mortem diagnosis on which I have already commented.

The death-rates from malaria in 1922 (excluding cases of blackwater fever, hyperpyrexia and pyrexia) are as follows :—

European death-rate = 2 per 1,000.
Asiatic death-rate = 1 per 1,000.
African death-rate = 1 per 1,000.

Including blackwater fever, hyperpyrexia and pyrexia, and accepting the dubious African post-mortem diagnoses, the death-rates become :—

European death-rate = 7 per 1,000.
Asiatic death-rate = 1 per 1,000.
African death-rate = 2 per 1,000.

An Analysis of the Malaria Notifications by Streets.

There is not sufficient information available to analyse the notifications by houses, largely owing to the fact that the house-numbering in Dar-es-Salaam is at present confused. In analysing by residence there is the obvious fallacy that a patient is not necessarily infected in his own quarters. The figures are, however, of some real value.

The streets showing the largest numbers of notifications are the following :—

Street.	European Cases.	Asiatic Cases.	Total.
Acacia Avenue	12	85	97
Market Street	—	86	86
Arab Street	17	57	74

An area described as "Gerezani," which includes Gerezani Road, Magazine Road, and parts of Arab Street and Pugu Street, shows :—

11 72 83

Street.	European Cases.	Asiatic Cases.	Total.
Kitchwele Street	8	24	32
Bagamoyo Street	—	30	30
Selous Street	6	22	28
Indian Street	—	18	18
Main Avenue	16	2	18
K.A.R., Gerezani	15	—	15
Park Road	12	—	12

The significance of these figures can be better appreciated from the enclosed map. The most thickly populated Asiatic area of the town lies north and north-east of the Askari Barracks shown on the map. The area lying south and south-west of the barracks is not so thickly populated. There are, however, many cases of malaria notified from this latter, and the figures suggest Gerezani Creek to be the main source of European and Asiatic infection.

Seasonal Incidence of Dar-es-Salaam Malaria, 1922.

Monthly notifications of malaria were as follows :—

Month.	Europeans.	Asiatics.	Total.
January	9	13	22
February	7	26	33
March	10	20	30
April	28	45	73
May	10	77	87
June	12	35	47
July	12	55	67
August	—	17	17
September	10	16	26
October	8	19	27
November	21	40	61
December	20	58	78
	147	421	568

Mosquitoes and Anti-Mosquito Work.

The progress in the reduction of mosquitoes has been maintained during 1922. The number of collections of larvæ found was as follows:—

	1922	1921
Anopheline	690	902
Culex	1,332	1,694
Stegomyia	697	892
	2,719	3,488

This represents a reduction of 25 per cent. in the total collections found and a reduction of 23 per cent. in Anopheline collections. The all-round improvement is illustrated on the enclosed chart which continues the record of rainfall and collections contained in the 1921 report.

The number of Anopheline adults caught during the year was 3,735 as compared with 578 only in 1921. This increase is due to the catching and counting having been regularly carried out this year for the first time.

The Anopheline Collections were found in the following areas:—

	1922	1921
Gerezani Valley	154	206
Msimbazi Valley	93	227
Kurasini and Dockyard ...	140	102
Town pools (Special Searcher)	127	196
Town (Sectional Searchers) ...	142	57
Traps	34	45

The 1921 figures are for nine months only so that the reduction is even greater than this table indicates.

A detailed table of the sources of all our collections of mosquito larvæ is given on the following page.

This table does not consider the tops of cocoanut-palms. They are undoubtedly one of the main sources, but there are no figures available for Dar-es-Salaam, except those obtained by Dr. Haworth's climber and in his possession.

Anti-Mosquito Work.

A permanent staff of 61 men under the control of Sanitary Inspector D'Souza has been employed on this work during the year. One hundred extra labourers were engaged for February and 150 for March, and were employed during these months at Gerezani, Msimbazi and Kurasini. A large area which had proved a fruitful anopheline breeding-place was levelled and prevented from retaining pools in the future. The clearing of grass and undergrowth revealed many breeding-places which were dealt with by draining or levelling. The number of collections in the Gerezani and Msimbazi valleys is considerably less than last year. Kurasini shows much the same figure and casual pools in the town show an increase. This is to a large extent accounted for by the numerous small pools on the golf links from March to June.

Gerezani Valley.

This is the most important anopheline area for the infection of the commercial town. By filling and levelling, about one-third of the available anopheline breeding-ground has been rendered safe, but this valley will call for systematic attention every year.

The sides of the Gerezani drains have been turfed during the year. This enables them to withstand the fretting of flood water and prevents them cracking and crumbling in the dry season. The water in the drains flows evenly and the access of the fish in the upper parts is facilitated.

Msimbazi Valley.

This is a vast tract of low-lying land containing numerous ditches and hollows which render it a prolific source of mosquitoes. Part of it only is under control at present. It is probably responsible for many of the mosquitoes at Carrier Corps, Bagamoyo Pool, and Upanga Golf Links. With the opening of the new market, even greater attention will have to be concentrated on his valley.

Kurasini and Dockyard.

The six creeks here provide a most difficult area for anti-mosquito measures. Much of our labour has been employed here during the year and many breeding-places have been discovered and dealt with. The number of mosquitoes bred here is still disappointingly high.

Traps.

There are 40 anopheline traps distributed over the town. The ones from which collections of larvæ have been obtained on more than one occasion are :—

Msimbazi trap	7	collections.
Gerezani trap	5	,,
P.W.D. trap (near Gerezani) ...	4	,,
Upanga trap	4	,,

SOURCES OF MOSQUITO LARVÆ FROM JANUARY TO DECEMBER, 1922.

	Drains.			Pools.		
	A.	C.	S.	A.	C.	S.
Gerezani	75	2	—	79	98	—
Msimbazi	80	7	—	13	19	8
Town (Special Searcher)	19	32	—	108	87	—
Street Gullies	—	155	—	—	—	—
Town (Sectional Inspectors) ...	17	139	2	103	132	3
Dockyard and Kurasini	41	21	—	99	65	1
Totals	232	356	2	402	401	12

	Drains.		
	A.	C.	S.
Traps	34	136	51
Tanks, jars and barrels	11	171	403
Cesspits and soakage pits...	—	196	1
Wells	11	59	—
Rubbish	—	5	15
Holes in trees	—	—	—
Dhows	—	8	77
Crab holes	—	—	136
Totals	56	575	683

CHART SHOWING THE RAINFALL, MONTH BY MONTH, IN DAR-ES-SALAAM DURING THE YEARS 1920, 1921 AND 1922.

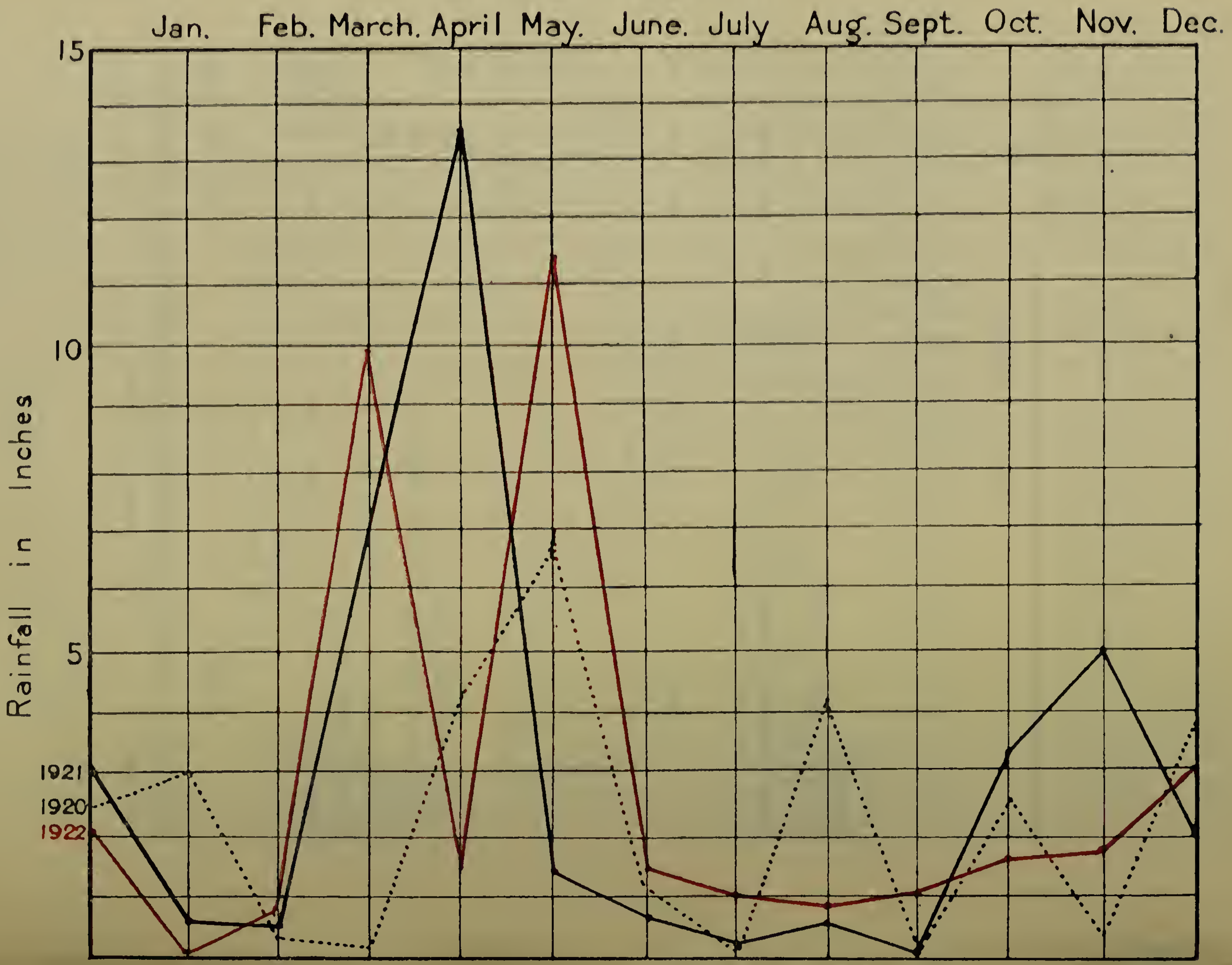
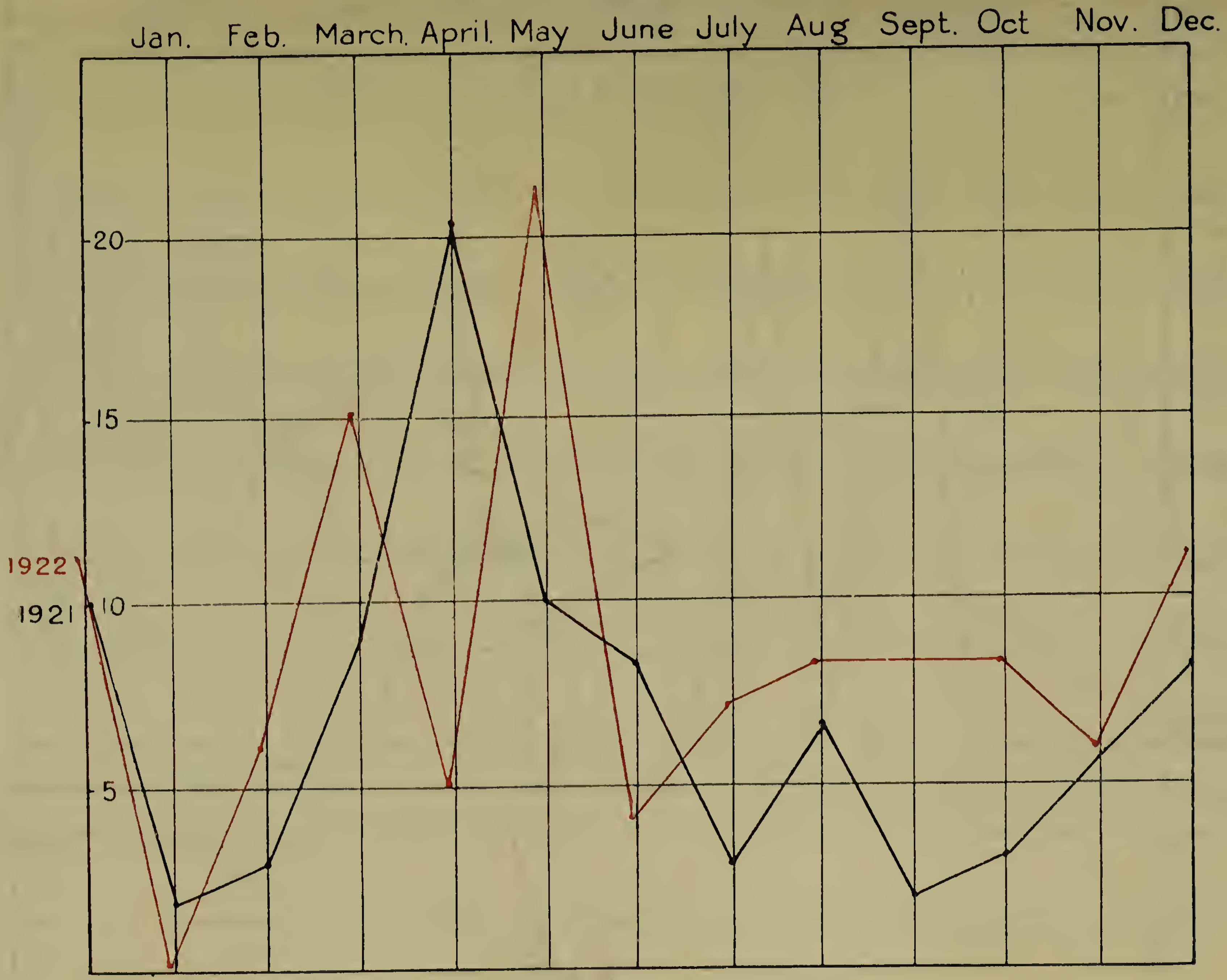
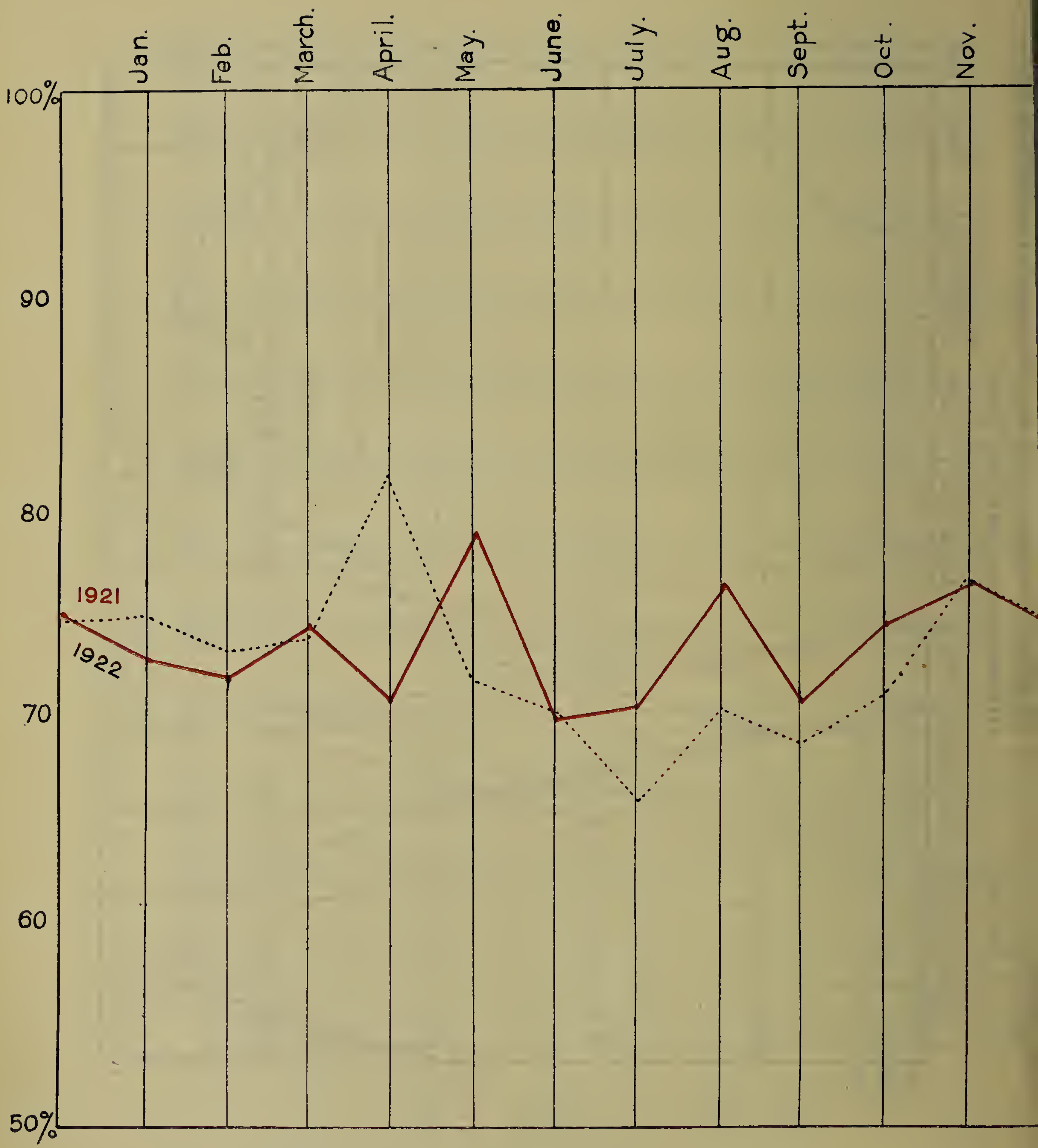


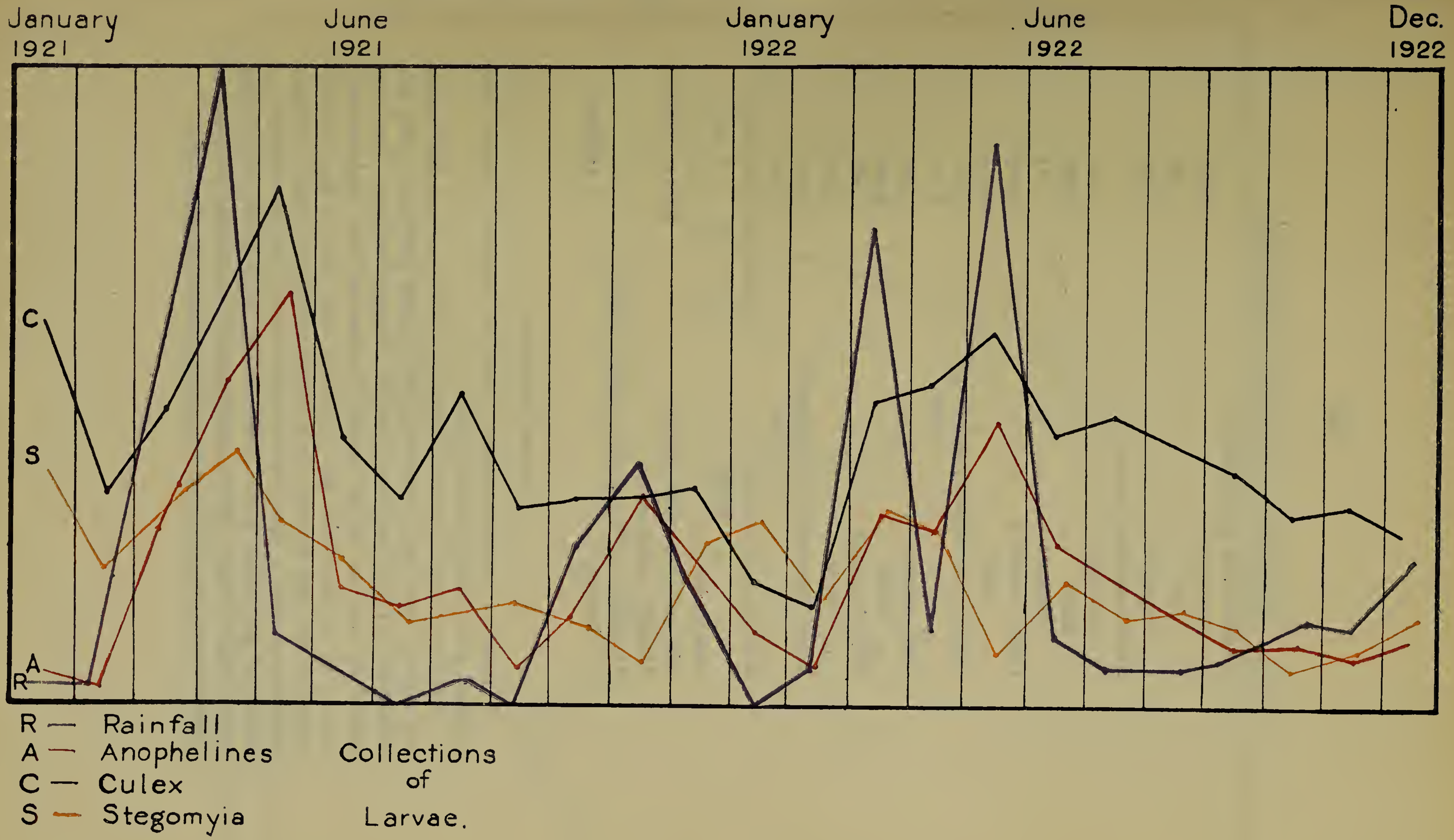
Chart Showing Number of Days on which Rain Fell during each Month in Dar-es-Salaam 1921 and 1922.





Humidity of Dar-es-Salaam, 1921 and 1922.
(From Mean Monthly Humidity Records of the Director of Laboratory.)

RAINFALL AND MOSQUITOES IN DAR-ES-SALAAM, 1921 AND 1922.



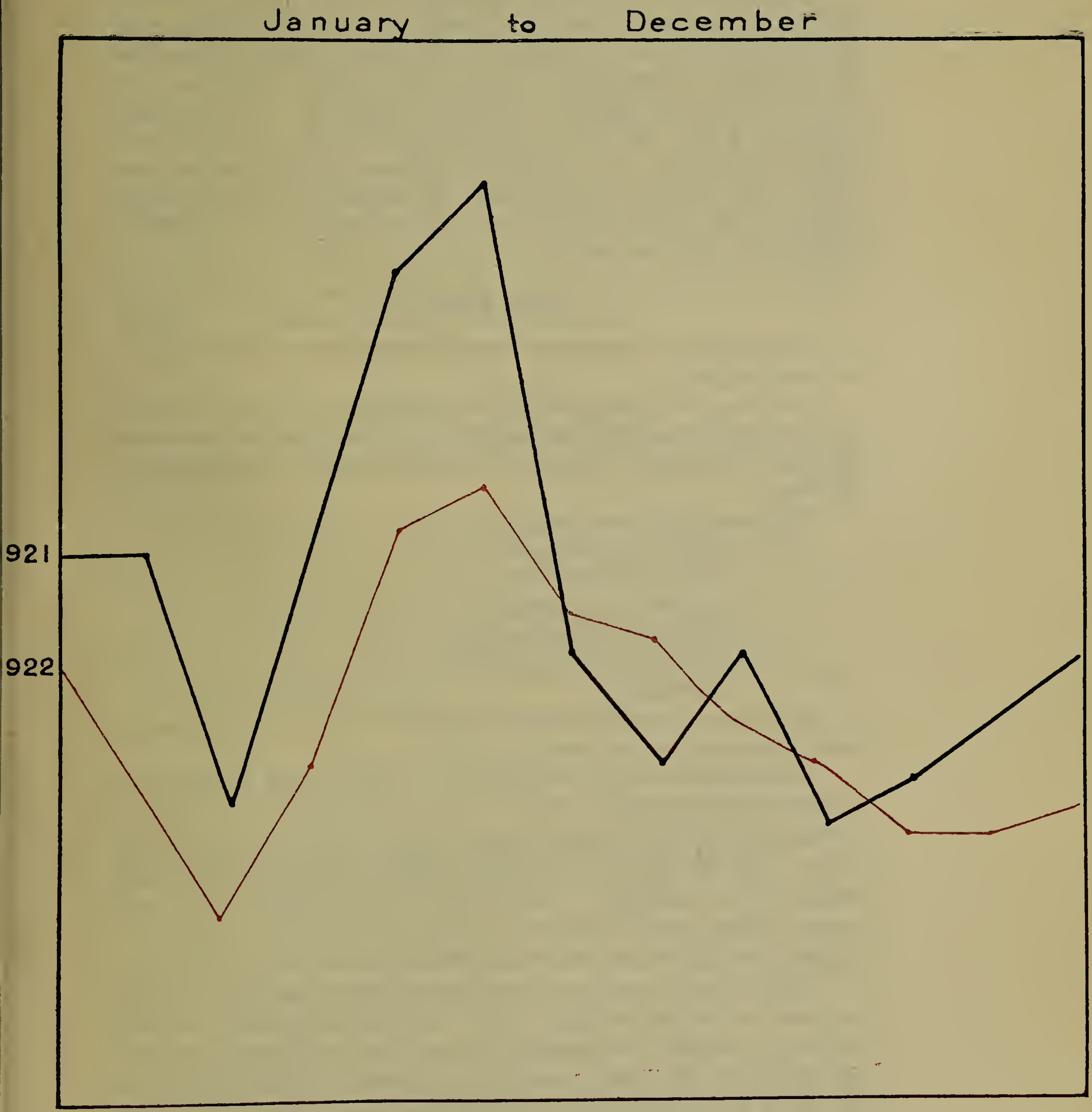
Summary of Anti-Mosquito Work Done.

Collections of larvæ found—	
Anopheline	690
Culex	1,332
Stegomyia	697
Adult mosquitoes caught—	
Anopheline	3,735
Culex	41,620
Stegomyia	64
Drains inspected	69,005
,, oiled	12,534
Cesspits and soakage pits inspected	94,661
,, ,, ,, oiled	9,104
Pools inspected	23,375
,, oiled	8,998
Wells inspected	25,281
,, oiled	7,203
Tanks, Jars and Barrels inspected	279,414
,, ,, ,, ,, oiled	1,914
Existing drains cleaned	370 miles and 1,682 yards.
,, ,, turfed	4 ,, ,, 2 ,,
New drains cut	1 ,, ,, 539 ,,
Pits and Excavations filled up	598,122 C. yds.
Mosquito notices served	12
Length of surface drains requiring regular cleaning	22 miles.

Trees and Mosquitoes.

A report on mosquito-breeding would be incomplete without some reference to the trees of Dar-es-Salaam.

The trees of the town are so numerous that the value of their beauty and shade is more than counter-balanced by their interference with air-circulation and the part they play in mosquito-breeding. Trees are particularly numerous in the Botanical Gardens and their neighbourhood, that is, in an area which lies between a large part of the European residential area and the sea. It is hardly necessary to point out that a plantation of trees in this part interferes seriously with the coolness and comfort of the houses in the Burton Street, Speke Street, and Garden Avenue neighbourhood. The tendency to plant more trees in the Botanical Gardens rather than to thin out the existing ones is to be depreciated.



Seasonal Incidence of Mosquitoes in Dar-es-Salaam during 1922 and 1921.
(From collections of larvæ found during each month.)

Mango trees and, above all, cocoanut palms need attention. Mango trees are not good shade trees for a tropical town, their interference with air circulation being out of proportion to the amount of shade given. The cocoanut palms of Dar-es-Salaam are, in many cases, diseased and have little value from an æsthetic or commercial standpoint. Of vastly more importance is their indictment by Dr. Haworth as one of the principal sources of mosquitoes. If we accept his conclusions, then the cocoanut palm is not a boon but a menace in the town. In Appendix 2, I include certain results of my own as independent corroboration of Dr. Haworth's exhaustive work on this subject.

WATER SUPPLY.

Real progress has been made during the year in the improvement of our water supply.

The source and quantity of the Dar-es-Salaam water supply has not, as far as I am aware, been investigated by any expert, and an unfortunate element of guesswork is, therefore, introduced into our calculations for the future.

The source of our water supply are :—

(1) Gerezani boreholes.
(2) Kurasini boreholes.
(3) Brewery boreholes.
(4) Kaiserhof boreholes.
(5) Carrier Corps boreholes.
(6) Wells.

The Gerezani boreholes yield a good water which is the main supply to the European town at present.

The Kurasini water is also good and appears likely to come into greater use in the future.

The Brewery and Kaiserhof waters contain an unpleasant amount of chlorides and the supply to buildings is being gradually reduced, and Gerezani water substituted. The Carrier Corps boreholes, which were extensively used in military times, will be re-opened early in 1923, and it is hoped to supply the new market and neighbouring parts.

There is little to add to the able review, given in the 1921 report by Dr. Scott, on the Dar-es-Salaam wells. They are all dangerous and will in time, it is hoped, be abandoned as a water supply for domestic purposes. The position for the future is something as follows. We shall require for the use of Dar-es-Salaam about 100,000 gallons of water a day. The resources of Gerezani are problematical, but it has yielded 35,000 gallons a day for the last five months without any sign of exhaustion. Kurasini is even more promising. A test carried out by the Water Overseer showed that after an initial fall during the first two hours of pumping, the level remained approximately constant during the next six hours of work. There are grounds for believing that Kurasini is capable of supplying 90,000 gallons a day. The Brewery boreholes and, above all, the wells, we hope to abandon as sources of domestic supply. The Carrier Corps boreholes, however, should prove a valuable supplement to the Gerezani and Kurasini supplies. We hope, then, to have in the future a central station of supply at Gerezani, supplemented from Kurasini and Carrier Corps and providing 100,000 gallons of good water daily. It must not be forgotten, however, that our resources are not accurately known and we cannot yet afford to consider the complete abolition of the well supply.

The progress made during 1922 is as follows:—

New Street Mains.

It is planned to lay new mains throughout Dar-es-Salaam. The major portion of this work has been completed during 1922. The new mains laid are:—

(*a*) From Gerezani by Main Avenue to Old Government House.
(*b*) Branch by Azania Front and Park Road to Government House and the European Hospital.
(*c*) Along Burton Street, from Main Avenue to Park Avenue.
(*d*) Along Speke Street, from Azania Front to Park Avenue.
(*e*) Along Versailles Street, from Azania Front to Garden Avenue.
(*f*) Along Mission Street.

New Tanks.

Two new elevated tanks, each of 10,000 gallons capacity, have been erected at Gerezani during the year. This means higher pressure and a constant supply where previously there was an intermittent one.

Replacement of Well Supply by Gerezani Main Supply.

This has been effected in the chief Government offices along Azania Front, but not yet in many private houses.

Constant supply in place of Intermittent one.

Many buildings have been put on the new main and now receive a constant supply. They include the Railway Offices, many large commercial buildings in Acacia Avenue and Versailles Street, the Dar-es-Salaam Club, the Government Press, and some private houses. Government House and the European Hospital are still, in part, dependent on the rather salty Brewery supply, but the installation of new pumps at Gerezani proposed for 1923 will admit of their receiving Gerezani water at all times.

Should the Carrier Corps water prove satisfactory, the new market, the abattoir and the Government School will receive a regular supply in 1923.

Fire Hydrants.

Forty-six fire hydrants have been placed on the new mains. This record of progress must be admitted to be a very satisfactory one for the year. An adequate and well-distributed water supply is the first of our health requirements. The distribution has been improved markedly.

CONSERVANCY.

Refuse Collection and Destruction.

This has already been discussed under the heading of Sanitary Labour.

Sewage Disposal.

The system of Dar-es-Salaam sewage-disposal has been dealt with thoroughly in previous annual reports, but the subject is of such importance that it is necessary to summarise the present situation again and to give in some detail the changes effected during the year and the improvements proposed.

For this purpose, Dar-es-Salaam can be conveniently considered in three areas as follows :—

(*a*) The Government residential area, west of Versailles Street, but excluding Azania Front.

(*b*) The commercial area through the centre of which runs Acacia Avenue. With this should be considered the offices on Azania Front. European and Asiatic buildings are included in this area.

(*c*) The African native town.

Area A.—Government House and the European Hospital have effective drainage systems by which sewage is led *via* a settling tank to the sea. The other houses in this area have porous sewage-pits in their compounds. Some of the pits are semi-permeable only and have to be emptied by cesspit pump and lorry at intervals. A map, included in last year's annual report, shows the proximity of wells and permeable sewage pits throughout this area. The system of porous pits in the compounds is admittedly bad, but in this area there are some mitigating circumstances. There is no crowding of houses, there is a large amount of vegetation, and the improvements in the water supply will relieve many householders of the necessity of using polluted well water for domestic purposes.

Area B.—It is in this area that our chief problems arise. It has comparative little vegetation, it is riddled with porous sewage-pits, and much of it is both overbuilt and overcrowded. The Germans constructed a series of sewers from parts of this area to the harbour, but few house-drains were connected to them, their main function apparently being to carry off storm water. A detailed examination of these sewers has been made during 1922 to determine if it were practicable or justifiable to make house-owners connect to them. Their condition is as follows:—The first five, draining the offices, etc., of Azania Front, are fairly efficient and well constructed. The Suliman Street sewer—a very important one for the east end of Acacia Avenue—is badly constructed, completely choked and useless. The Bridge Street, Selous Street, Bagamoyo Street, and Mission Street sewers are all of sound construction and in fair condition. The Bridge Street one is at present half choked and requires heavy flushing. The Barracks sewer and the K.A.R. sewer are bad from many points of view and are discussed in detail elsewhere. The outfalls of all the sewers are bad, but are to be repaired early in 1923. It seems justifiable to admit the existing sewers as our present method of disposing of the sewage of the Azania Front and Acacia Avenue neighbourhoods. Unfortunately, the overbuilt and overcrowded Market Street area does not come within their scope. There lies hope, however, for closing some of the pits of this area in the inevitable migration to Carrier Corps which will follow the removal of the market. These existing sewers can be used independently of any new system adopted for the European residential area. They are admittedly imperfect, but the necessity for some system in the area is immediate. The sewers are now being repaired and more buildings are connecting with them.

Area C.—The system in the native town may be disposed of briefly. Most houses have two pits, one for excreta and the other for waste water. The system is old but simple, and in practice appears to involve little nuisance or danger. The pits are well constructed, deep and dark, and the destruction of the undiluted excreta by anærobic organisms is facilitated. The danger from well pollution will be reduced with the improvement of the main water supply.

During 1922, a new sewer has been laid in Station Street and the K.A.R. sewer at Gerezani reconstructed. In 1923, all the outfalls will be repaired, a new sewer will be laid in Suliman Street, and the Barracks sewer reconstructed.

HOUSING AND TOWN PLANNING.

The chief factor influencing the present town planning of Dar-es-Salaam is the pending removal of the market from the centre of the Indian area to the new site at Carrier Corps. Plots have been allotted in the neighbourhood of the new market and many native houses of a good type have already been erected. The future expansion of Dar-es-Salaam in this direction is very promising. Round the fine market building will run broad streets, the shops of which will be all built to a definite structural and sanitary standard. West of Msimbazi Street is planned a new native quarter on open and symmetrical lines. It unfortunately borders on Msimbazi creek, which is one of the most fruitful anopheline breeding grounds. 1922 has shown a marked improvement in the reduction of anophelines here, but even greater attention than in the past will have to be concentrated on anti-mosquito work in this creek.

There will be an inevitable migration from the overcrowded area surrounding the present market to the new area, and the day comes nearer when it will be possible to consider the demolition of much of the overbuilt and insanitary property in the present market neighbourhood.

Some progress has been made during the year in the clearing of the neutral zone. The reconstruction of dilapidated shell-shocked houses in Arab Street has been planned and the work of some of them is already in hand.

Where native houses have been condemned and any overcrowding or other circumstances have made it inadvisable to rebuild on the same sites, the owners have been allotted new plots at Carrier Corps. The Medical Officer of Health has been accompanied by representatives of the Land Office and the Public Works Department on weekly tours of inspection of the town. In all, during the year, 1,295 houses have been inspected with a view to repair.

The four new houses in Burton Street and Park Avenue are approaching completion.

1922 has shown real progress and promise in the improvement of the planning and buildings of the town; 1923, with the completion of the new market, promises even better.

PORT HEALTH.

No case of notifiable disease entered Dar-es-Salaam through the port during the year.

The case of Dhow 35K is discussed in detail in the plague section.

Number of ships inspected during the year ...	305
Number of dhows ,, ,, ,, ,, ...	560

Quarantine Island.

The island has been cleared by the labour of this office during the year It may prove of use in the event of a serious epidemic in the town making it advisable to isolate a large number of contacts.

CONDEMNATION OF FOODSTUFFS.

The following lots of foodstuffs were condemned during the year :—

Foodstuffs.	Quantity.	Reason.
Meat (tinned) ..	1 Lot	Blown through immersion in salt water.
Meat Essence ..	1 „ (1 case) ..	Unfit for human consumption.
Ham	1 „	Do. do.
Currants	1 „ (19 tins) ..	Do. do.
Raisins	1 „ (1 tin) ..	Do. do.
Oatmeal	1 „ (35 tins) ..	Do. do.
Almonds	1 „ (72 tins) ..	Do. do.
Condensed Milk ..	8 Lots (7 cases and 40 tins) ..	Decomposed or curdled.
Potatoes	1 Lot (5 bags) ..	Unfit for human consumption.
Apricots	1 „ (19 tins) ..	Do. do.
Jam	1 „ (5 cases) ..	Do. do.
Beans	1 „ (9 cases) ..	Do. do.
Cocoa	1 „ (2 cases) ..	Do. do.
Cocoa Essence ..	1 „ (1 case) ..	Do. do.
Cheese	1 „ (1 case) ..	Do. do.
TOTAL ..	22 Lots	

INSPECTION OF SCHOOL CHILDREN.

The school children have been examined weekly by the Sub-Assistant Surgeon or Compounder. Drugs and dressings are kept at the school and minor ailments treated there. The more serious cases are referred to Sewa Hadji Hospital. In all, 1,228 examinations of children have been made during the year, the chief complaints being ulcers, conjunctivitis, otorrhœa, coughs and malaria.

A series of lectures on the prevention of disease has been delivered to the student teachers by Native Sanitary Inspector Ubwa Salim.

NATIVE SANITARY INSPECTORS.

The native sanitary inspectors have received a course of lectures on the ætiology and prevention of disease, with special reference to the diseases of Dar-es-Salaam. They have shown interest and a desire to progress.

Two trained inspectors have been posted to outstations and two probationers engaged locally are being trained to fill the vacancies.

NEW WORKS, 1922.

The most important new works carried out in Dar-es-Salaam during the year may be summarised as follows :—

Water Supply.

The new mains, new tanks and other improvements have already been detailed.

New Market.

The major portion of the work of converting the fine German exhibition building at Carrier Corps into a market has been carried out during the year. The floor, drains and office have been completed. The construction of market furniture-tables, meat-safes, etc., is in hand.

Surface Drainage.

The Chafu Koga drain has been completed during the year. This drain was urgently required and will take the flood water, which formerly filled the Chafu Koga depression each rainy season, to the Bagamoyo Pool, and thence it will find its way to the sea by the Upanga drain. The Chafu Koga hollow has been largely filled with the burnt products of the incinerators, and it is hoped that in 1923 the new drain will prevent the flooding of this part of the native town which has occurred in previous years. New culverts have been constructed in connection with this drain and the New Street and Selous Street drains.

Sewers and House-Drains.

The prison drainage has been reconstructed, trough closets have been installed and the drain to the Selous Street sewer relaid.

The K.A.R. sewer has been repaired. Previously, the broken outfall allowed constant fouling of the foreshore and the absence of any trap meant an offensive smell in the latrines. These nuisances have been corrected by the erection of a trapped settling-tank near the latrines and prolongation of the outfall into the harbour.

A new sewer has been laid in Station Street to receive the sewage of a number of large buildings in Acacia Avenue. The Suliman Street sewer to which the new sewer connects is choked and has no fall, so that a new sewer in Suliman Street is necessary before the new sewer can be utilised.

New sanitary fittings have been installed in several government houses and house-drains have been reconstructed.

The drainage system of the Versailles and Prince of Wales Hotels have been reconstructed by the owners during 1922.

Construction and Repair of Buildings.

The four new houses in Burton Street and Park Avenue and the Garden Avenue bungalows have been started during the year.

The four houses and one bungalow will be ready for occupation early in 1923.

NEW WORKS PROPOSED FOR 1923.

Water Supply.

The improvements include installation on new pumps, opening of Carrier Corps supply, connection of the new market, the school, the abattoir and government houses.

New Market.

It is hoped to complete and open the new market in 1923.

A new dried-fish market will also be constructed.

Sewers and Drains.

The outfalls of all the sewers will be repaired.

The Barracks drainage-system and sewer will be reconstructed.

The present sewer is a large untrapped concrete tunnel, badly constructed, and in bad repair. At present it fouls the shore, admits a current of sewer air into the barracks and presents an uninterrupted run for rats from harbour shore to barracks. Trough closets will be installed, a new sewer laid, and the existing outfall prolonged.

Rat-proof Go-downs.

A site has been allocated for go-downs and it is hoped that their erection may be commenced in 1923.

Erection and Repair of Buildings.

Burton Street and Garden Avenue houses will be completed.

New European houses at Gerezani, new Asiatic and African houses near Pugu Street will be erected by the Tanganyika Railways.

The churches are to be repaired.

The large shell-shocked buildings at the west end of Acacia Avenue are to be repaired.

New public latrines are to be built in Suliman Street and their sewer extended to admit of the junction of the Station Street sewer referred to above.

School.

The Government School will be extended during 1923.

Transport Garage.

It is hoped that this garage will be removed to a more suitable site. It will then be possible to extend the prison and reconstruct the entrance to the main landing stage.

APPENDIX No. 1.

COST OF CERTAIN SECTIONS OF SANITATION, DAR-ES-SALAAM.

Quarantine and I.D.H.

Salary of Sub-Assistant Surgeon	Shs.	6,000.00
Boat boys, I.D.H. Labour and Ward boys ...	,,	4,601.00
Vaccinators	,,	356·06
Rat boys	,,	696.77
Total ...	Shs.	11,653.83

Cost of upkeep, depreciation, petrol for motor-boat, food, drugs and equipment for the Infectious Disease Hospital not included.

General Duty.

Total cost	Shs.	14,417.13
Cemetery boys	,,	1,113.11
Tree Cutters	,,	2,352.16
Hedge Cutters	,,	2,505.09
Total ...	Shs.	20,387.49

The General Duty Gang are used chiefly in grass and bush cutting in the roads and open spaces, periodically they assist the Mosquito boys in the Gerezani and Kurasini areas.

REFUSE COLLECTIONS AND DESTRUCTION.

Ox Cart boys	Shs.	9,932.24
Ox Grazers	,,	624.28
Refuse dump boys	,,	5,125.32
Feed for oxen in dry season	,,	120.00
Total ...	Shs.	15,801.84

Cost of tools, depreciation, etc., not included, also Petrol for conveying fuel for Incinerators.

Cart loads of refuse removed and burnt. 27,180 pr. Sh. 57 per cart load.

Cost of running one Autocar per day. Shs. 20/-

LATRINE AND MARKET SWEEPERS.

Latrines	Shs.	4,471.02
Market	,,	1,916.94
Total ...	Shs.	6,387.96

Cost of Tools and Equipment not included.

OFFICE AND ADMINISTRATIVE.

Medical Officer of Health (Salary and Allowance only)	Shs.	15,000.00
Sanitary Superintendent 1st Grade (Salary only)	,,	7,600·00
,, ,, 2nd Grade ,, ,,	,,	5,900.00
,, ,, ,, (Temporary) ,,	,,	5,000.00
Clerk (Asiatic)	,,	2,680.00
Native Clerk	,,	940.00
Office boys	,,	2,009.78
Native Sanitary Inspectors	,,	7,869.32
Storekeeper (Native)	,,	432.00
Carpenter (Native)	,,	863.99
Mason (Native)	,,	646.15
Yard boys	,,	871.00
Laboratory	,,	296.00
Compensatory Allowances to M.O.H. and Sanitary Superintendents	,,	9,263.80
Total ...	Shs.	59,372.04

Does not include Upkeep of Cars of Medical Officer of Health and Sanitary Superintendents.

Cesspit emptying—

Pump boys	Shs. 1,419.09
Cesspits emptied	2,472 loads.
i.e., Cost of pumping labour per load	·59 Sh.
Cost of one Daimler 2-ton lorry per day	Shs. 21/-
Less charges for emptying private cesspits	,, 3,633·68

Road Sweeping.

Residential area	Shs.	4,244·58
Commercial area	,,	3,634·33
Native quarters	,,	2,513·94
Total ...	Shs.	10,392.85

Not inclusive of wear and tear of carts.

Anti-Mosquito Measures.

Mosquito Clerks	Shs.	1,134.12
,, Fundis and Oilers	,,	9,791·35
,, Drainers (permanent)	,,	21,987·31
Drainage and Swamps (P.W.D. Fund) ...	,,	6,739·49
Sanitary Inspector D'Souza	,,	6,000.00
Total ...	Shs.	45,652.27

Cost of Kerosine, Cresol, tools and uniforms not included.

APPENDIX No. II.

COCOANUT PALMS AND MOSQUITOES.

The following investigation was carried out by me at Tanga in April and May, 1922, on the lines suggested by Dr. Haworth. The object was to obtain corroboration of his results, working during a different season and employing other climbers.

Three climbers examined the tops of 804 cocoanut-palms between 15/4/22 and 9/5/22. They brought down 105 collections of water from the tops, and 90 of these contained Mosquito-larvæ. Adult mosquitoes were bred out from 57 of these 90 collections as follows :—

Stegomyia fasciata	29	collections.
Culex fatigans	22	,,
Stegomyia metallica	9	,,
Other species	4	,,

(Two species were sometimes found in one collection.)

These correspond with the species found in the town during this period. No anophelines were found in town or in the trees. I myself saw larvæ-containing water brought down on more than one occasion.

SUMMARY.

13% of the palms examined held water in the tops.
86% of the collections of water contained mosquito-larvæ.
11% of the palms examined were breeding mosquitoes.

TANGANYIKA TERRITORY.

Report of the Dar-es-Salaam Laboratory,

For the Year 1922.

A. INTRODUCTORY.

This report covers the period of January to December, 1922, inclusive, and is the second completed years' work in the Laboratory.

Owing to my departure on leave, the work carried out has been largely routine only. Dr. Howarth's work on mosquito breeding in cocoanut trees of Dar-es-Salaam has been a continuation of his work in Tanga and has opened up a new feature in the breeding places of mosquitoes.

1. STAFF.

I proceeded on leave of absence in February and returned in September, 1922. Dr. Howarth had most of the work of the Laboratory in his hands since the beginning of the year and took over complete charge during February.

Mr. Hammond has been Assistant in the Laboratory throughout the year and has taken entire charge of the Calf Vaccine production with excellent results.

The Native staff has remained the same as in the previous year.

2. BUILDINGS.

These remain as previously. The animal houses sorely need repair and will be undertaken as soon as possible. An extension of the present Laboratory is necessary if we are to continue to carry out the Chemical work which appears to be increasing rapidly. The old German plans for extending the buildings are available.

3. EQUIPMENT.

Minor additions have been made during the year. The advent of an electrically-driven machine for grinding lymph has been a great asset.

4. LIBRARY.

Periodicals are received as stated in the 1921 Report, and the following books have been added during the year :—

Clinical Bacteriology ...	Emery.
Elements of Statistics ...	Bowley.
Intestinal Protozoa of Man ...	Dobell and O'Connor.
General Pathology	Beattie and Dickson.
Special Pathology	Beattie and Dickson.
Jurisprudence	Taylor.
Technique of Teat and Capillary Glass Tube	Wright.
Tests for Alkaloids	Stephenson.
Detection of Poisons	Autenrieth.

5. EXPERIMENTAL ANIMALS.

(*a*) *Monkeys.*—These are still obtained through the Political Office, and have done well.

(*b*) *Guinea Pigs.*—These have bred extremely well, but there is a noticeable inferiority in complement strength which appears to be more marked during the hotter months of the year, when a satisfactory green food is more difficult to obtain.

(*c*) *Sheep.*—These have kept very well and have increased considerably in numbers. The majority were sold towards the end of the year.

B. GENERAL EXAMINATIONS.

I. BLOOD.

1. *Blood Films.*—Routine examination is still carried out by the thick film method and is eminently more satisfactory than the thin film for diagnostic work. In my opinion, a much greater experience is required to interpret results so that these are carried out entirely by the Officer in charge

of the Laboratory, and I am convinced that a negative result is of great value. It is not sufficiently appreciated that a positive result, particularly in Natives, is not necessarily a complete diagnosis.

The following numbers and their source have been examined :

European Hosp.	Native Hosp.	Out-Stations.	Other Med. Officers.
367	1,156	13	49

This makes a total of 1,585 slides examined for parasites, an increase of 445 slides over the previous year.

(*a*) Blood parasites in Europeans.—In a total of 375 films the proportion of findings was as follows :—

Spirillum duttoni	7	=	1·8 %
Benign Tertian	14	=	3·7 %
Subtertian	124	=	·33 %
Crescents	7	=	1·8 %
Microfilaria	0	=	0·0 %
Negative	223	=	59·4 %

The type of malaria parasites was as follows :—

Subtertian	85·5 %
Benign Tertian	9·6 %
Crescents	4·8 %

(*b*) Blood parasites in Natives and Asiatics.—Amongst 1,210 slides, the proportion of findings was as follows :—

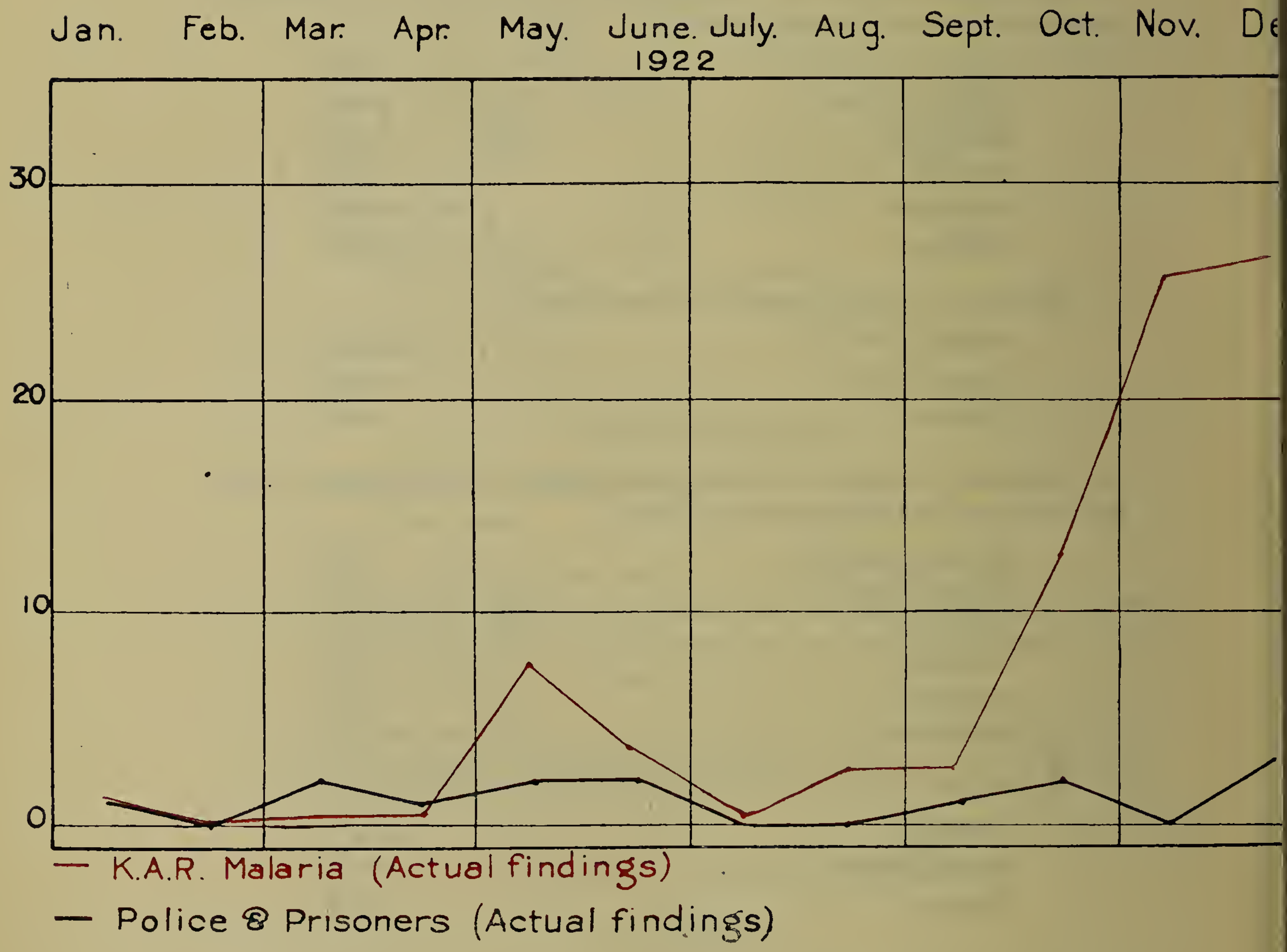
Spirillum duttoni	24	=	1·9 %
Benign Tertian	45	=	3·7 %
Subtertian	292	=	24·1 %
Crescents	15	=	1·2 %
Microfilaria	31	=	2·5 %
Negative	803	=	66·4 %

The malarial findings have appeared in the following proportion :—

Subtertian	82·9 %
Benign Tertian	12·7 %
Crescents	4·2 %

There was a very considerable rise in the Malaria findings towards the end of the year which appeared to be largely confined to the K.A.R., and may be explained by an influx of recruits chiefly from the Iringa district, and the presumption is that they were relatively less immune than the Dar-es-Salaam population.

The following curve, Chart 1, shows this rise, and with this has been plotted the curve obtained from the Police and Prisoners during the same periods.



(*c*) *Relapsing Fever.*—There has been a fair increase in this infection over 1921, a total of 31 cases compared with 10 in 1921. Ten cases occurred in the K.A.R's, but the infection seems to be chiefly acquired on the Iringa Road rather than in Dar-es-Salaam, though cases have occurred in the local population.

(*d*) Microfilaria.—Amongst 1,210 films from Natives, the infection works out at 2·5%. No cases have been found in Europeans. Sheathed and unsheathed varieties were found.

(*e*) Trypanosomiasis.—Only one slide has been examined to confirm the diagnosis made in the Mwanza area.

(*f*) Malaria and Meteorology.—A delicate creature such as the Anopheline mosquito must be greatly affected by the prevailing humidity of its surroundings. If this is so, the malaria incidence in this district should depend mainly on two factors, the mosquito population and the relative humidity. Temperature may be a third factor, but probably may be neglected in the tropics.

From general observation, the most likely time for a European to be attacked by mosquitoes is from 6 p.m. until he protects himself with a mosquito net, and the humidity during that time may well be an influencing factor in determining the activities of the Anopheline mosquito.

The incubation period in man will probably throw the curve out to 10 to 14 days.

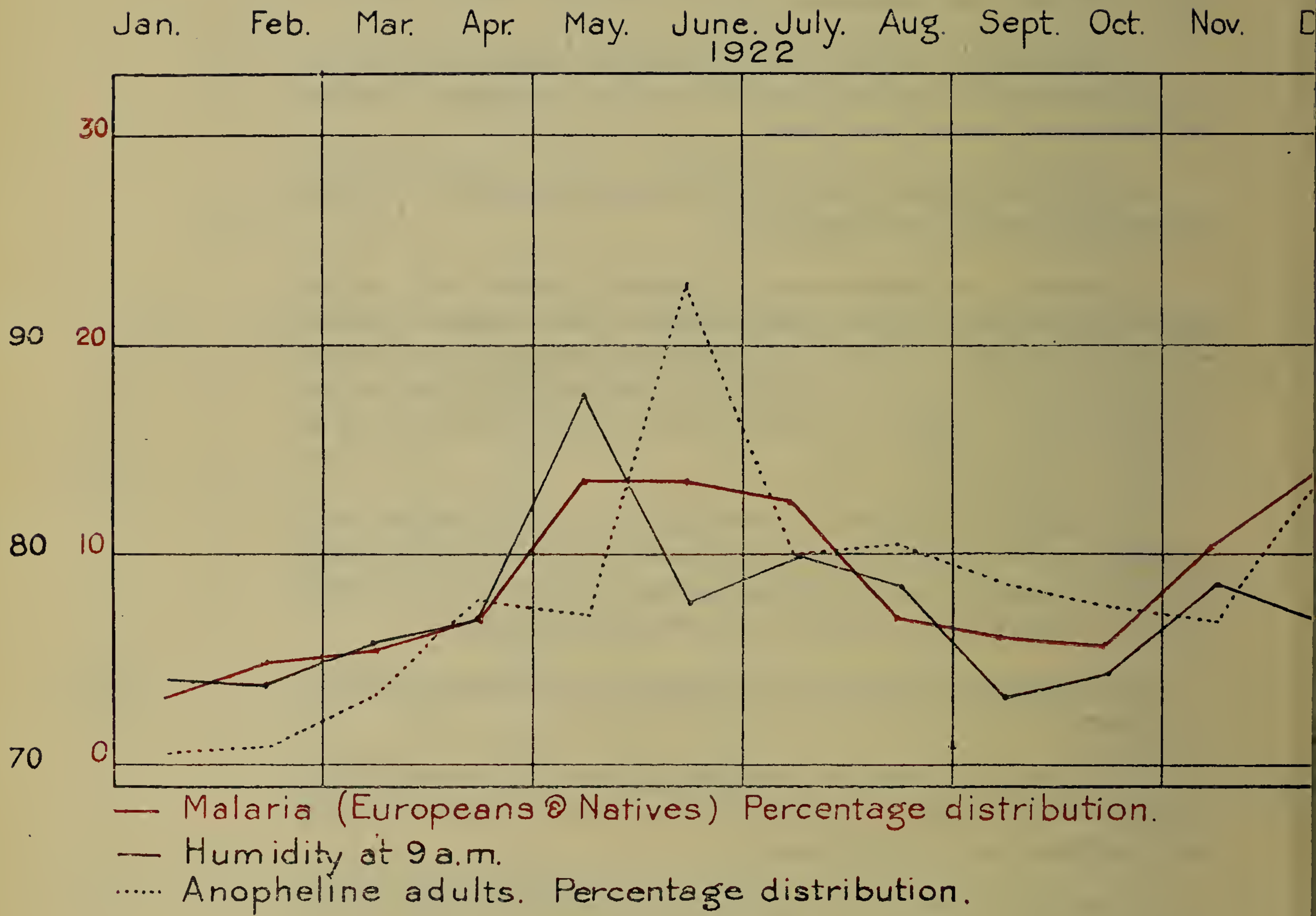
Many disturbing factors are undoubtedly present, but in spite of that, I think there is interest in the following charts with the malaria, humidity and Anopheline curves super-imposed.

Unfortunately, no 8 p.m. humidity records have been kept, and the 9 a.m. humidity is plotted as nearest records available.

Whether it will be possible to classify the healthiness of districts on their humidity will only be determined by many series of observations. To what extent the humidity of Dar-es-Salaam is kept up by its extensive vegetation is at present not known.

I have to thank the M.O.H. for supplying me with his Anopheline figures.

Further charts will be found under Meteorology.



2. AGGLUTINATIONS.

There has not been a great demand for these, though it takes a definite part in the final diagnosis of organisms isolated from stools.

A total of 11 sera have been sent which yielded six negative and four positive for typhoid, and one positive for para typhoid *B*. In each positive case the infection occurred at some outstation and not at headquarters.

3. WASSERMANN REACTIONS AND FLOCULATION TESTS.

Fifty-four specimens of serum and two specimens of cerebro-spinal fluid have been examined during the year.

Seven out of this total were received from outstations.

Fifty sera have been examined by the full Wassermann technique, yielding positive results in 17 and negative in 33.

Six sera were examined only by the Sachs Georgi test, yielding four negative, one positive and one doubtful result.

Nine sera were examined by both Wassermann and Sachs Georgi technique and yielded parallel results, except in one case.

There appears to me to be some difficulty in reading the finer results in the Sachs Georgi method, and it appeals less to me than the more recent Kahn test which is being employed now in conjunction with the Wassermann test.

4. BLOOD CULTURES.

Unfortunately, this has not been largely carried out, having given way to cultivation from fæces, only three having been performed, each with negative results.

II. FÆCES.

(*a*) Microscopical.—150 specimens have been examined, 55 in Europeans, and 95 in Natives and Asiatics.

The majority of the European cases were negative, but in nine Entamœba histolytica was found Seven cases showed flagellates, two being Lamblia infections. Amongst the 95 Native cases, Ankylostome ova were found in 21. Trichiuris is commonly met with, but is not recorded. Ascaris ova were found in five, Lateral spined Bilharzia ova in two, and Tænia in one.

Eight cases showed heavy flagellate infections, and Entamœba histolytica was found on 11 occasions.

Forty-six examinations proved negative.

No case of coccidiosis has been found.

(*b*) Bacteriological.—This is chiefly confined to the enteric and dysentery group.

The enteric group was searched for on eight samples, but each proved negative.

The dysentery group was searched for on 12 occasions with three positive findings—each proving to be B. Dysenteriæ Flexner Y. type.

III. URINES.

(*a*) General Examinations.—A total of 73 specimens were examined, 30 from Europeans and 43 from the Native Hospital.

Among the European specimens, 10 were negative and 13 showed pus present, probably of Urethral origin.

Three specimens were well marked cases of nephritis.

One specimen showed blood and two cases hæmoglobin and one case bile.

Among the specimens from the Native Hospital, the only cases of interest were six, showing bilharzia ova, and two with marked glycosuria, and three with evidence of nephritis.

(*b*) Bacteriological.—Six samples were investigated ; five for the enteric group with negative results. One case showed a B. Coli infection.

IV. PUS.

Forty-three specimens were sent for diagnosis. The majority being urethral or vaginal in origin, 14 such slides were examined amongst Europeans, seven showed gonococci.

Twenty-two vaginal or urethral smears were examined from the Native Hospital, only six showed gonococci. The remaining slides were not of particular interest. One slide from Singida showed the presence of B. Pestis.

V. SPUTUM.

One hundred and fourteen specimens were received, 12 from the European Hospital and the remainder from the Natives.

Amongst the 12 Europeans, two showed tubercle bacilli.

Amongst the 102 Native cases, tubercle bacilli were found on 20 occasions.

The pneumococcus was cultivated on two occasions from sputa that were allowed to dry on porous tiles.

VI. SCRAPINGS FROM NODULES AND ULCERS.

(*a*) For Spironema Pallidum.—Ten specimens were taken; five from Europeans and five from Natives. Spironema pallidum was present in three from each group.

(*b*) For Bac. Lepræ.—Thirty-three were examined, one European with negative result, the remainder from Natives, with positive results in fourteen.

(*c*) For Vincent's Organisms.—This was found once in a European.

VII. POST-MORTEM MATERIAL AND TISSUES.

Three specimens were received.

1. Human lung—no evidence for tuberculosis.
2. Plague—from a man found dead on a dhow.
3. Dik-dik—no evidence for tuberculosis.
4. Placental tissue.
5. Ulcer excised suspected to be anthrax and found negative.

VIII. VACCINES.

Only two have been prepared, both for furunculosis.

IX. MISCELLANEOUS.

Four specimens of Cerebro spinal fluid were examined. Two showed the meningococcus.

Ten swabs from throats were examined for diphtheria, four from Europeans and the remainder from Natives; in none was the diagnosis confirmed.

Six scrapings of skin for tinea were examined, two showed the presence of mycelia and spores.

A liver puncture fluid was examined for amœbæ, but proved negative.

A batch of ticks from Bukoba proved to be ornithodorous and were not infective.

The testing of the efficacy of the Native Hospital sterilizer was made on one occasion and not found wanting, except for spore-bearing organisms.

C. CHEMICAL EXAMINATIONS.

(*a*) Milk.—Seven samples of condensed milk were received for analysis under Government Notice No. 54 of 1921.

Four failed to reach the required standard of fat content.

Two samples of cow's milk from the market were examined and found to be unadulterated.

One sample of human milk was examined.

(*b*) Mineral and Vegetable.—These have been very varied.

A sample of fæces was sent for Arsenic detection with negative result.

Two samples of Boiler scale were analysed.

Four samples of Sulphuric acid from the Railway and electric Light Departments were submitted for examination for impurities.

A specimen of Mortar and ten Mineral Salts sent from the Public Works Department were analysed and reported upon.

A locally manufactured gunpowder was sent in by the police for investigation.

A fairly large quantity of Sodium Potassium Bismuth Tartrate was prepared at the request of the Deputy D.M.O. The reports from the Native Hospital as to its efficacy appear to be satisfactory. The actual constitution of this salt appears very doubtful, whether it is a single salt or a mixture of salts.

An interesting herb was sent from Morogoro which had been used as a fish poison. Its power to stupefy and then kill fish was well marked and its active principle appeared to be a saponin and hot picrotoxin which is the usual fish poison.

D. MEDICO-LEGAL.

Nineteen cases have been dealt with during the year and have taken up a considerable time in the Laboratory.

(*a*) Rape Cases.—Four in number. Garments and smears having been sent in each case for examination for blood or spermatozoa. Each case has occurred locally. Three cases yielded positive results and one negative.

(*b*) Blood Stains.—A portion of wood, a knife, and a spear and seven garments were submitted for examination for blood stains from two murder cases.

Positive results were obtained from the portion of wood, knife, and one garment—the remainder were negative.

(*c*) Poisons.—The actual chemical or vegetable exhibits sent numbered 20 to be analysed, consisting of Native medicines in five cases and each yielded negative results.

Thirteen chemicals or mixtures were examined for poisons—Strychnine and Silver Nitrate were the only two suggestive results obtained.

A portion of bread submitted from Tanga contained large quantities of Arsenic, as also did a sample of well water from the Dar-es-Salaam district.

Five samples of Stomach contents were sent for examination, the only positive case being one in which Antimony was detected.

Other post-mortem material was sent in two cases, but yielded negative results.

E. WATER ANALYSIS.

Thirty-nine waters were examined chemically, though rarely a complete examination was made.

Twenty-five waters from different stations along the Railway were received for a report as to their suitability for boiler purposes.

They varied in permanent hardness from 120 parts per 100,000 to nil per 100,000. The chloride content also varied from 160 parts to nil parts per 100,000. In one sample there was a very high saturation with Magnesium Sulphate.

Thirteen samples of various supplies of drinking water were examined chemically, though the whole technique was not gone through. The local soda water was found to contain a large amount of Nitrites and the source of its origin appeared to be largely due to the manufacture of ice by Ammonia plant in the same building. A small trace of Nitrites was found in the original water as supplied for soda water manufacture, but its origin was traced to the iron piping.

The general bacteriological results were much the same as in 1921.

The very small incidence of Intestinal disorders in Dar-es-Salaam would suggest that the local water is fairly safe.

F. RAT EXAMINATIONS.

These have been done in a routine way daily. A total of 4,625 rats were examined during the year, 4,497 were classed as Mus rattus and the remaining 128 as Mus decumanus.

No case of plague infection was discovered.

G. METEOROLOGY.

(*a*) *Rainfall.*

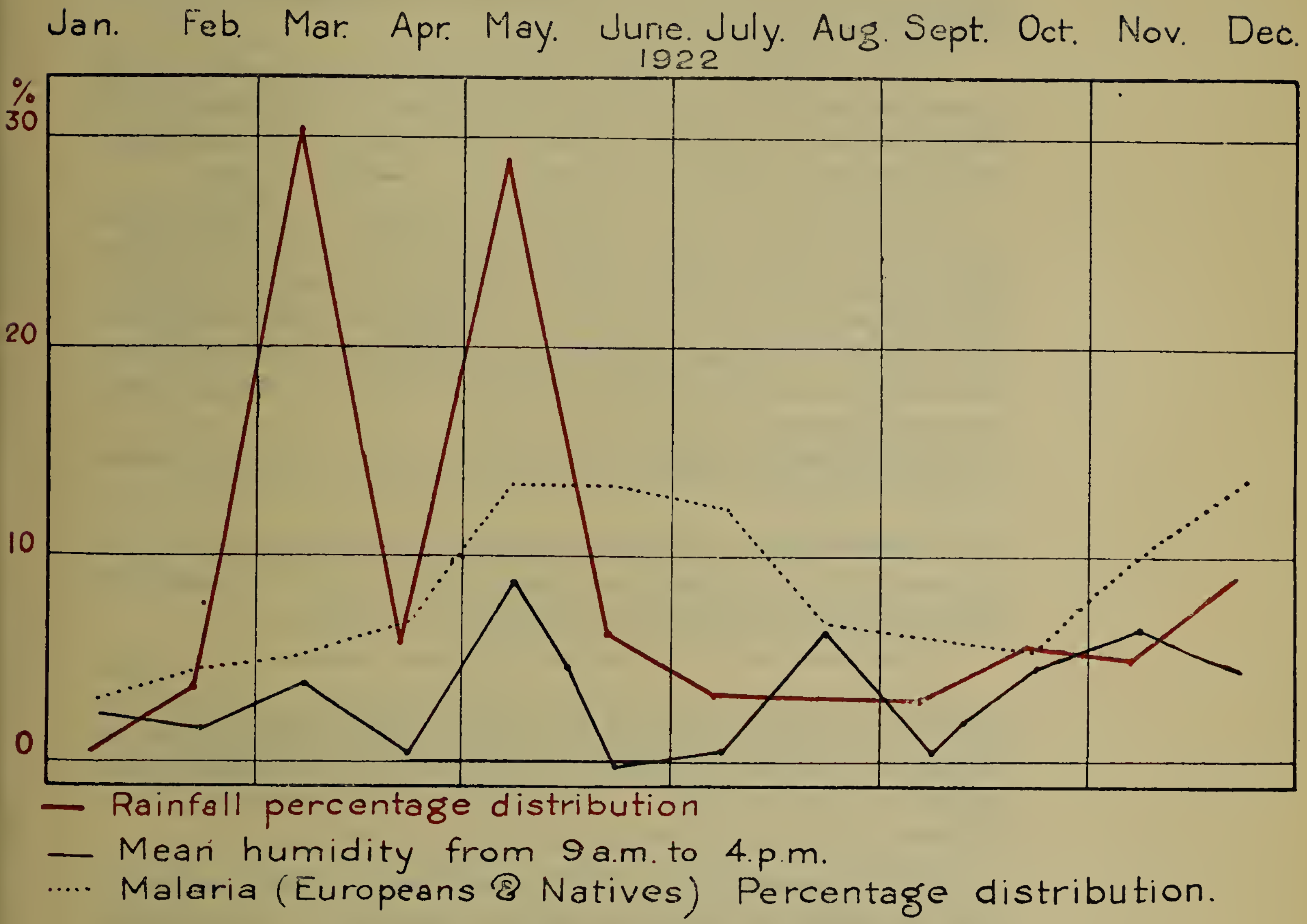
	Total in inches.	No. of days on which rain fell.	Maximum on any one day.
January	·024	2	·02
February	·992	5	·64
March	9·744	12	3·35
April	1·750	5	·77
May	9·214	23	3·2
June	1·924	5	1·45
July	·962	8	·28
August	·912	11	·35
September	·884	6	·6
October	1·648	9	·66
November	1·488	7	·6
December	2·812	11	·81
	32·354	104	3·35

Though the rainfall was some 3 inches less than in 1921, there were 10 more days in which rain fell in 1922, and the year was generally damper than 1921, as will be seen from the humidity figures which follow :—

(*b*) *Temperature.*

	Mean.	Highest Recorded.	Lowest Recorded.	Mean Humidity.	Mean 9 a.m. Humidity.	Mean 4 p.m. Humidity.
January ...	84·4	92·3	78·8	72·44	74·08	70·80
February ...	83·7	91·4	71·6	71·64	73·80	69·48
March ...	82·4	92·3	73·4	73·82	75·84	71·80
April ...	80·1	91·4	70·7	70·39	77·00	63·78
May ...	77·5	89·6	68·0	78·88	87·45	70·32
June	75·5	86·0	64·	69·9	77·80	62·16
July	74·0	86·0	62·6	70·40	79·70	61·13
August ...	74·6	86·9	63·5	76·33	78·62	74·04
September ...	75·7	86 9	63·5	70·48	73·28	67·68
October ...	77·7	87·8	67·1	74·50	74·24	74·84
November ...	80·6	89·6	69·8	76·44	78·66	74·22
December ...	82·2	90·5	71·6	74·5	76·97	72·08

The following charts illustrate graphically the Rainfall, the Malaria Incidence and the Mean Day Humidity which seems to have no relation to either of the others.



H. ANTI-VARIOLOUS LYMPH.

The technique of this having settled down into routine matter, Mr. Hammond has been placed in charge of its manufacture, and the satisfactory results that continue to be obtained reflect great credit on his work.

There has been no alteration in the stables and fittings.

Calves are obtained weekly, two at a time, through the Veterinary Department and the supply has never failed, which is due to creditable organisation between the two departments. The Veterinary Department now understands our peculiar wants, and meet them as far as they are able.

(*a*) The Seed.—This, as stated in the 1921 Report, was originally obtained from a case of small-pox in a Native, and by care in its preservation and by alternate passage through monkey and calf has kept up its virulence now for eighteen months, and, with care, there would appear to be no reason why it should fail us.

(*b*) The Technique.—Daily inspection and gentle cleaning of the vaccination area with 50 per cent. watery dilution of Glycerine is still carried out, and the gentle application of a mixture of Ether and Alcohol over the vesicles before they are scraped off is, I believe, of value.

The preparation of the lymph has been greatly simplified with the advent of a grinding machine, electrically driven. Considerable heating of the grinding parts and the lymph occurred on first using the apparatus and occasioned some alarm, but the vaccine pulp is now ground with sterile water first, and subsequently the calculated quantity of Glycerine and Clove oil, added so as to make up the final dilution of one part of pulp to four parts of dilument.

This preliminary grinding with water seems to prevent an undue amount of heat developing.

As stated above, a 50 per cent. solution of Glycerine in water with one in 1,000 Clove oil is added, is still used as a dilument for the lymph. No attempts have been made to make other types of Vaccine.

Three weeks on ice is allowed to lapse before issue.

For the greater part of the year phials containing 1. cc. have been estimated to contain 100 doses, but owing to some suggestions that the volume was insufficient to vaccinate 100 individuals, it was decided to issue 1½ ccs. for each 100 doses. Corresponding with this change, there is a proportional decrease in yield per calf compared with 1921.

(*c*) Bacteriology.—Owing to my absence through a good deal of the year, no detailed report has been kept of the bacteriology; but each batch has been subjected to routine examination to eliminate anthrax and tetanus. These organisms have not been met with and no untoward results have been obtained with the lymph. Staphylococcal organisms of Aureus or Albus variety are usually met with, and an occasional non-pathogenic Spore-bearer.

(*d*) Keeping qualities and Transport.—These are suprisingly good considering the long distances the lymph has to travel before use.

The phials are still packed in wooden boxes in crushed ice and sawdust, but from our Laboratory experiments, it appears that the contents of the package reach room temperature in 48 hours or less.

Two Thermos flasks were obtained for trial, but the narrowness of the necks prevents them being of much use.

Shortly, I hope to be able to try the Vaccine transport boxes as advertised by Gallenkamp.

(*c*) Statistical Results.—During the year, 51 calves were inoculated as against 87 in 1921. The decrease was due to slackening in the demand for lymph during the middle months of the year.

The yield in pulp from these calves was 388 grams, giving an average per calf of 7·6 grams.

The doses prepared during the year were 178,750 as against approximately 170,000 in the previous year.

The doses issued to various stations during the year were 173,450 as against approximately 146,000.

The maximum yield from any one calf was 23 grams, and the minimum yield 1·5 grams. Two calves failed to take.

The average yield in doses per calf was 3,505 doses.

The Zanzibar Government has been a regular purchaser of lymph to the extent of 25,700 doses.

Their continued demand suggests that they are satisfied with the results obtained.

The chief demand for lymph in this territory has come from Tabora, Tanga and Arusha.

(*f*) Vaccine Returns.—Out of the 173,450 doses issued, returns have been received accounting for 36,956 individuals vaccinated.

These are classified as follows :—

Vaccinations.	Positive.	Modified.	Not seen again.	Failures.
36,956	22,386	1,058	5,283	8,219

This gives an average of 60·5 per cent. case successes.

I have no means of gauging the accuracy of these reports, but judging from verbal reports from several Medical Officers, they are well satisfied with the results obtained.

The reports received vary in the percentage of successes from 95 per cent. to 10 per cent.

Prompt use of the lymph after receipt appears to be the chief deciding factor, provided non-immunes are selected.

The worst feature appears to be a lack of returns for 136,494 doses issued, which means that 78·6 per cent. of the doses are unreported upon. The difficulties of returning to districts to re-inspect results must be very great in many cases and must be taken into account.

The tabulated results are as follows :—

Place.	Doses issued.	Number of Vaccinated reported upon.	Positive.	Per cent.	Not seen again.	Modified.
Arusha	13,700	—	—	—	—	—
Af. Dispensary ...	50	—	—	—	—	—
Bagamoyo	1,600	1,688	1,501	89	—	—
Bukoba	2,000	60	—	—	60	—
Dodoma	1,300	258	198	76·8	—	—
E. Hosp. Dsm. ...	150	—	—	—	—	—
Handeni	2,300	2,600	2,067	79·5	—	—
Iringa	2,300	—	—	—	—	—
Kasanga	1,300	370	141	38	—	—
Kilwa	2,200	1,255	135	10	823	—
Kilosa	1,400	963	389	40	98	190
Kigoma	4,100	1,787	626	35·2	390	—
Kondoa-Irangi ...	1,200	1,700	935	55	347	331
Kahama	300	—	—	—	—	—
Lindi	1,500	1,034	555	53·6	—	—
Lushoto	1,400	1,400	1,337	95	—	—
Moshi	2,700	300	44	15	—	—
Mheza	200	—	—	—	—	—
M.O.H., Dsm. ...	1,200	—	—	—	—	—
Massoko	1,400	—	—	—	—	—
Mahenge	1,550	1,120	777	69·3	16	—
Mafia Island ...	5,800	—	—	—	—	—
Mikindani	400	277	164	60	82	—
Mbulu	1,300	1,000	591	59	—	—
Musoma	1,200	300	220	73·3	—	—
Morogoro	3,100	—	—	—	—	—
Mohoro and Utete...	2,000	1,811	278	15	1,145	165
Mwanza	6,600	982	461	47	—	12
Namanyere ...	100	—	—	—	—	—
Pangani	1,800	1,499	1,307	87	62	—
Shinyanga	1,300	—	—	—	—	—
Songea	1,800	—	—	—	—	—
Sewa Hadji Hosp.	100	—	—	—	—	—
Singida	1,700	90	20	22	—	—
Tabora	45,600	2,032	742	36·5	464	—
Tanga	27,400	12,730	8,598	67·5	1,796	360
Tunduru	1,400	1,600	1,300	81·2	—	—
Tukuyu	1,300	—	—	—	—	—
Ujiji	1,000	—	—	—	—	—
Zanzibar	25,700	—	—	—	—	—
	173,450	36,956	22,386	60·5	5,283	1,058

I. SPECIAL INVESTIGATIONS.

1. Cocoanut Trees as Breeding Places for Mosquitoes.—While Dr. Howarth was in charge of the Laboratory he carried on his investigation in Dar-es-Salaam on the above subject.

As his investigation is not yet completed, I can only allude to his reports sent in from this Laboratory.

	Palms examined.	Per cent. holding water.	Per cent. with larvæ.
January	64	70·3	61·8
February	347	80·1	78·3
March	332	97·6	96·6
April	482	98·2	97·2
May	362	99·7	99·4
June	347	100	99·4
July	334	100	99·4
August	76	100	100

Anophelines, Aedes, Megarhinus and Culex are the main Genera to which the mosquitoes belong.

The importance of the observations that even the highest cocoanut tree may form breeding places for mosquitoes is obvious to all workers in similar districts in the tropics.

2. *Leprosy.*—This report is continued from the Annual Report for 1921 and the cases referred to are the same patients.

The cases have been housed in the Infectious Diseases Hospital and have been treated throughout the period covered by this report by Chaulmoogra Ethyl Esters X and Y which were obtained from the Welcome Research Institute.

In the 1921 Report, an account was given showing how a start was made with intramascular injections and then intravenous injections of equal parts of Ether and Chaulmoogra Esters, finally replacing both these methods by intravenous injections of the drugs in undiluted form.

The intravenous route has proved much more satisfactory, and when the drug is given in undiluted form it is unaccompanied by any discomfort or sensations.

The dosage I have employed by these various methods has been up to 4 cc. intramuscularly and up to 2½ cc. approximately by the intravenous route and from the point of view of the comfort of the patient the intravenous route is undoubtedly the best.

The injections have been given weekly with occasional intermissions which have been unavoidable. The time necessary to carry out this treatment has prevented me or my colleagues devoting more than a weekly visit, and I put down to this the rather slow progress that has been obtained.

The opinions which I have derived from this experience are that—

(i) A whole-time Medical Officer is required to carry out the work satisfactorily;

(ii) Much bigger injections should be tried, or they should be more frequent;

(iii) Satisfactory results are only likely to be obtained from early cases and to them alone should most attention be given.

(iv) The occurrence of yaws or syphilitic lesions in association with leprosy is so common amongst Natives that before any other treatment is begun, it would seem worth while treating the former state, first in order to eliminate many confusing conditions.

CASE I.

Age 63. Nationality—Mauritian. Onset of illness, 1920 (?).

Treatment:—Chaulmoogra Ethyl Ester X.

(*a*)	Intramuscular	10 Injections	10- 4-21 to 10- 7-21.	Total 15·5 ccs.
(*b*)	Intramuscular	2 ,,	21- 8-21 to 28- 8-21.	,, 6· ccs.
	Intravenous (Ether Ester mixture).	13 ,,	24- 7-21 to 13-11-21.	,, 8·7 ccs.
(*c*)	Intravenous (pure drug).	70 ,,	20-11-21 to 31- 7-23.	,, 108·1 ccs.

Clinical Conditions:—

1921. Anæsthesia is very difficult to make out, but appears up to about the ankle of the left foot, but is less on the right. No ulceration of the toes then nor in January or April, 1922.

Hands apparently only anesthetic at tips of fingers. Ulcers are present below each nail of both hands and in some cases the finger nails have almost gone. Tips of the fingers are covered with a thin atrophic skin.

1923, August. There is not much evidence of improvement, but at the same time the disease has not progressed very much.

Ulceration at the finger tips is still slight, but present, and ulceration is appearing on each toe.

Bacteriological Reports:—

20-4-21. Wasserman negative. Scraping from finger ulcer-masses of acid fast organisms.

15-1-22. Finger ulcer. Acid fast bacilli still plentiful.

9-4-22. Nasal Swab. Very numerous acid fast bacilli.
Sept. 23. Finger ulcer and toe ulcer still show many acid fast bacilli.

Remarks.—There must be a very large nerve element in this case of leprosy and the progress is nil.

CASE II.

Age 45. Nationality—Coast Native. Onset 1912.

Treatment :—Chaulmoogra Ethyl Esters X and Y alternate injections.

(*a*)	Intramuscular	8 Injections	10- 4-21 to 17- 3-21.	Total 15·5 ccs.
(*b*)	Intramuscular and	3 ,,	21-8-21 to 11- 9-21.	,, 11· ccs.
	Intravenous (Ether Ester mixture).	15 ,,	24- 4-21 to 13-11-21.	,, 14·3 ccs.
(*c*)	Intravenous	26 ,,	20-11-21 to 22- 6-22.	,, 37·4 ccs.
(*d*)	‘ 914 ’ ·45 gram	1 ,,	2-12-21.	
(*e*)	Bismuth Sod. Pot. Tart. 6 grains.	1 ,,	24-4-22.	

Clinical Conditions :—

1921.	1923.
Nodules marked on forehead, alæ nasi on lips and below.	Still well marked on forehead and alæ nasi. Lips healed.
No eyebrows.	No eyebrows.
Ulcers—many broken down and scattered over body about the size of a florin or shilling.	Only one ulcer left on chest, which is still open.

Largely a mixed infection of syphilis or yaws and leprosy.

Bacteriological Reports :—

31-3-21. Wasserman strongly positive. Ulcer on wrist shows masses of acid fast bacilli.
15-1-22. Ulcer ulnar edge right forearm—masses of acid fast bacilli.
9-4-22. Nasal swab acid fast bacilli very numerous.
28-8-23. Ulcer chest—a few acid fast bacilli.

Remarks.—There is no question that there was a mixture of diseases here. The man has undoubtedly improved, which improvement commenced before any anti-syphilitic treatment; but the last report showed leprosy bacilli still present.

CASE III.

Age 40. Nationality—Coast Native. Onset 1911.

Treatment :—Chaulmoogra Ethyl Ester X.

(*a*)	Intramuscular	8	Injections	10- 4-21 to 17- 7-21.	Total	15· ccs.
(*b*)	Intramuscular	4	,,	21- 8-21 to 11- 9-21.	,,	12·5 ccs.
	Intravenous (Ether Ester mixture).	15	,,	24- 7-21 to 13-11-21.	,,	13·8 ccs.
(*c*)	Intravenous (pure drug).	61	,,	20-11-21 to 26- 3-23.	,,	9· ccs.
(*d*)	Subcutaneous	2	,,	2-10-21 to 9-10-21.	,,	·5 cc.
(*e*)	'914' ·45 grams	1	,,	2-12-21.		
(*f*)	Bismuth Sod. Pot. Tart. 6 grains.	1	,,	24-4-22.		

Clinical Conditions :—

1921.	August, 1923.
Eyebrows gone.	Eyebrows gone.
Nodules.—Face, forehead, arms, forearms, chin.	Still the same.
Right hand.—Fingers rather swollen, except thumb.	About the same.
Nails ulcerated away.	The same.
Small ulcer on little finger.	Healed by 15-1-22.
Left hand.—Small ulcer thumb knuckle.	Healed now.
Nail complete thumb and first finger.	The same.
Nail almost gone on little finger.	Unchanged.
Nail partial on middle finger.	Unchanged.
Legs.—Both rather elephantoid in appearance, and walking difficult.	Walking with confort and generally better.
Toes.—Trophic changes, but no ulcers.	Unchanged.
Ears.—Hard and stiff.	Not much softer.

		31-3-21.	2-10-21.	15-1-22.	28-8-23.
(*a*) Right Ear.	Horizontal	$2''$	$2''$	$1\frac{5}{8}''$	$1\frac{5}{8}''$
	Vertical	$2\frac{7}{8}''$	$3''$	$2\frac{7}{8}''$	$2\frac{7}{8}''$
(*b*) Left Ear.	Horizontal	$1\frac{7}{8}''$	$2''$	$1\frac{5}{8}''$	$1\frac{1}{2}''$
	Vertical	$3''$	$3\frac{1}{8}''$	$2\frac{3}{4}''$	$2\frac{3}{4}''$

The subcutaneous injections were given under two nodules over the left olecranon process—they are now gone.

Bacteriological Reports :—

31- 3-21. Wasserman strongly positive.

Scraping from ulcer, right little finger, shows masses of acid fast bacilli (this ulcer is now healed, August, 1923).

2-10-21. Puncture fluid from nodule over left olecranon shows many acid fast bacilli (nodule now gone after subcutaneous injection).

9- 4-21. Nasal swab, acid fast bacilli very numerous.

28- 8-23. Scraping from small ulcer under nail, right middle finger—many acid fast bacilli.

Remarks.—Though this case has not shown marked improvement, she is certainly no worse, but distinctly improved in small details.

CASE IV.

Age 50. Nationality—Coast Native. Onset 1918.

Treatment :—Chaulmoogra Ethyl Ester Y.

(*a*)	Intramuscular	11 Injections	10- 4-21 to 17- 7-21.	Total 25·5 ccs
(*b*)	Intramuscular and	4 ,,	4- 8-21 to 13- 9-21.	,, 13·5 ccs
	Intravenous (Ether Ester mixture).	13 ,,	24- 7-21 to 13-11-21.	,, 11· ccs.
(*c*)	Intravenous (pure drug).	78 ,,	20-11-21 to 31- 7-23.	,, 128· ccs.
(*d*)	'914' ·45 grams	1 ,,	2-12-21.	
(*e*)	Bismuth Sod. Pot. Tart. 6 grains.	1 ,,	28- 4-22.	

Clinical Conditions :—

1921.	1923.
Nodules marked on forehead, eyelids, back, arm and chest.	Well marked, but improved.
Eyebrows.—Just present.	Just present.
Legs.—No nodules.	Few scattered nodules about ankles.
Arms.—Many nodules.	Present, but much less.
Ulcers.—None present.	None present.
Back.—Like a thick leather cuirass and no Native tatoo marks visible.	Much improved and tattoo marks visible after four months' treatment.
Alæ nasi very thick and hard.	About the same.

	31-3-21.	2-10-21.	15-1-22.	23-8-23.
Horizontal measurement	2⅜″	2⅝″	2¼″	2⅓″
Ears very hard and massive.		Distinctly softened.		
Right—				
Vertical	3⅜″	3½″	3¼″	3″
Horizontal	2″	2⅛″	1⅞″	2⅛″
Left—				
Vertical	3¼″	3⅝″	2⅞″	3″
Horizontal	2″	2″	2″	1⅞″

Bacteriological Reports :—

31-3-21. Wasserman strongly positive.
Puncture fluid from left ear show masses of acid fast bacilli.

15-1-22. Puncture fluid from left ear, many acid fast bacilli.

9-4-22. Nasal scraping. Acid fast bacilli very numerous.

22-8-23. Puncture fluid from small subcutaneous mass on the wrist shows many acid fast bacilli, as also does a similar mass on the right ankle.
Puncture fluid from left ear still shows many acid fast bacilli.

Remarks.—There is quite a well-marked improvement in the nodules of the arm, chest, back and forehead. The eyelids, which contained a hard lepromatous mass, are now comparatively soft.

The ears are softening and tend to fall over where previously they were stiff and rigid.

Lepromatous nodules, however, are now formed on the legs where previously none were noted.

CASE V.

Age 45. Nationality—Coast Native. Onset doubtful.

Treatment :—Chaulmoogra Ethyl Ester Y.

(*a*)	Intramuscular	3 Injections	26-6-21 to 10-7-21.	Total 5 ccs.
(*b*)	Intramuscular	2 ,,	21-8-21 to 28-8-21.	,, 8 ccs.
	Intravenous (Ether Ester mixture).	16 ,,	17-7-21 to 13-11-21.	,, 16 ccs.
(*c*)	Intravenous (pure drug).	27 ,,	20-11-12 to 30-6-21.	,, 39 ccs.
(*d*)	‘914’ ·45 grams	1 ,,	2-12-21.	

Clinical Conditions :—

1921.	1923.
Nodules.—Ears, forehead—alæ nasi.	Less, but still present.
Both cheeks.	Distinctly less.
Each nipple and eyelids.	Nipples normal.
Ulcers.—Right little finger knuckle	Healed by 15-1-22.
Ear margins.	Healed by 15-1-22.
Alæ nasi and lips.	Healed by 15-1-22.
Feet.—No ulcers—appearance of old yaws.	About the same.

Bacteriological Reports :—

26-6-21. Scrapings from ulcers on alæe nasi—show masses of acid fast bacilli. Wasserman positive.

15-1-22. Puncture from nodules on right cheek—many acid fast bacilli.

9-4-22. Nasal scraping—acid fast bacilli very numerous.

Remarks.—There was obviously a mixed infection of yaws and leprosy here. The man has improved greatly—some ulcers showing acid fast bacilli having definitely healed and certain lepromatous patches have disappeared, but he is a leper still.

Case VI.

Age 30. Nationality—Coast Native. Onset about August, 1921.

Treatment :—Chaulmoogra Ethyl Ester X.

(*a*)	Intramuscular	No Injections.		
(*b*)	Intravenous (Ether Ester mixture).	4 Injections	16-10-21 to 13-11-21.	Total 4·3 ccs.
(*c*)	Intravenous (pure drug).	78 ,,	20-11-21 to 31- 7-23.	,, 123·4 ccs.

Clinical Conditions :—

October, 1921.	August, 1923.
Nodule.—Thickening over left eyebrow without scar marks, these became visible after four injections.	Apparently normal, except for one slight nodule.
Cheeks.—Both feel thickened.	Apparently normal.
Pigmentation.—Few light-coloured patches on back and chest.	Still present, but less.
Ulcers.—None.	No ulcers anywhere.

Bacteriological Reports :—

16-10-21. Puncture fluid from thickened tissue over left eyebrow showed many acid fast bacilli, but shorter in type than usual.

15- 1-22. Puncture fluid from same area as above shows only scanty acid fast bacilli.

2- 4-22. Puncture fluid from same area as above—no acid fast bacilli (probably the small nodule was missed).

9- 4-22. Nasal swab—showed acid fast bacilli.

23- 8-23. Puncture fluid from small nodule over left eyebrow still shows acid fast bacilli, which are of normal appearance and not short as formerly.

Remarks.—This case has improved, but appears to have become stationary for some time. Acid fast bacilli are still present in the lesion over the eyebrow, but it is only careful examination that detects the small nodule remaining there.

No photographs are available.

CASE VII.

Age about 25. Nationality—Coast Native, male. Onset beginning Dec. 1921.

Treatment :—Chaulmoogra Ethyl Ester Y.

(*a*) Intramuscular Nil.

(*b*) Intravenous (pure drug). 33 Injections 18-12-21 to 4-10-22. Total 49·5 ccs.

Clinical Conditions :—

December, 1921.	October, 1922.
Thickened area over left eyebrow 1 in. by 1¼ in.	Healed.
Circular nodule on left cheek ½ in. in diameter.	Healed.
Circular nodule just to left of centre of forehead ⅜ in. in diameter.	Healed.

Softening of each of these areas was quite obvious after six injections.

Bacteriological Reports :—

14-12-21. Puncture over eyebrow—acid fast bacilli—short type.
Puncture from forehead—acid fast bacilli of short type.

16- 1-22. Puncture from over eyebrow—a few doubtful acid fast bacilli.

9- 4-22. Puncture from over eyebrow—no acid fast bacilli.
Nasal swab—a few acid fast bacilli.

22-10-22. Nasal swab—negative.

No photographs were taken of this case, for the lesions were very small.

Remarks.—Apparently a very early case, and was discharged as cured in October, 1922.

Case VIII.

Age 40. Nationality—Coast Native. Onset 1915.

Treatment :—Chaulmoogra Ethyl Ester Y.

(*a*) Intramuscular 4 Injections 10-4-21 to 1-5-21. Total 6·5 ccs.

This man has been included in the series because he was one of the original and best of the cases, but absconded after one month's treatment only ; he gives a very good picture, which shows rapid progress of the disease and is useful to compare with the other cases at the same intervals.

The Larynx is not involved. Lepromatous masses are everywhere much worse, and whereas there was practically no ulceration, now there is a good deal on the extremities and ears.

Bacteriological Reports :—

4-4-21. Wasserman negative.

4-4-21. Scraping from ulcer on left elbow shows many masses of acid fast bacilli.

March, 1921.	July, 1923.
March, 1921.	July, 1923.

General Comments.

The following features have become impressed on me while dealing with this series of cases and other lepers.

1. The more common association of leprous ulceration in individuals with mixed infections of yaws or syphilis and leprosy.

2. The tendency of the peripheral lesions to clear up less than others ; in fact, in some of the cases while there has been amelioration of the general body lesions, there has been no diminution of the peripheral lesions, or even an increase, while under the above treatment.

3. The association of a much shorter type of acid fast bacillus in the two early cases, in one of which, however, the ordinary type of bacillus is now to be found.

I have to thank Dr. Davey for allowing me to use the Chaulmoogra Ethyl Esters supplied to him through Col. Balfour.

To Dr. Davey I am also indebted for the photographs and to many colleagues in helping me when I have been unable to give the injections myself.

G. G. BUTLER.

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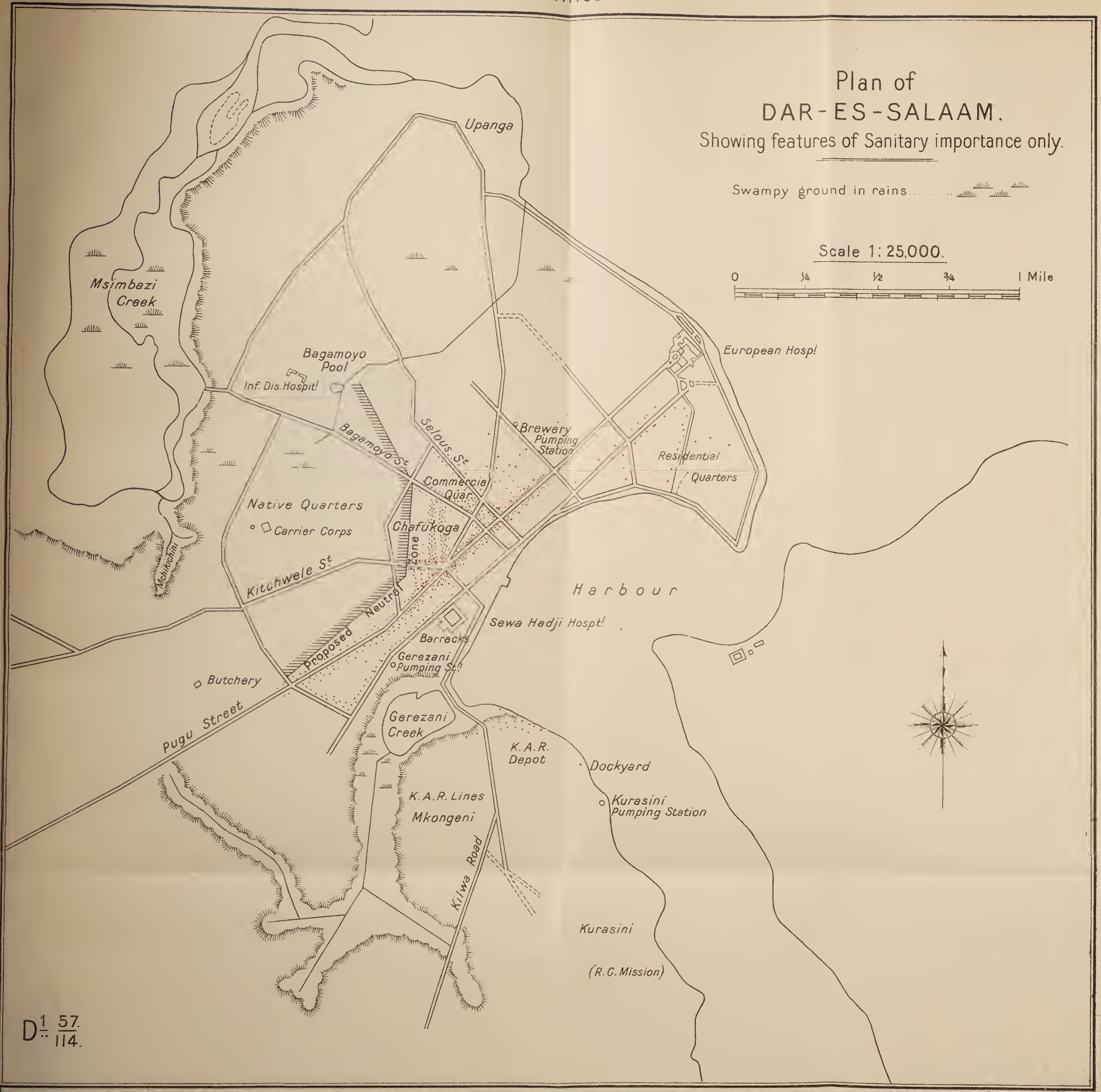

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